

THE
EXPLANATION
OF THE
Frontispiece.

*First cast your Eye upon a Rustick Seat,
Built strong and plain, yet well contriv'd and neat;
And situated on a healthy Soyl,
Yielding much Wealth with little cost or toyl.
Near by it stand the Barns, fram'd to contain
Enriching Stores of Hay, Pulse, Corn, and Grain;
With Bartons large, and places where to feed
Your Oxen, Cows, Swine, Poultry, with their Breed.
On th'other side, hard by the House, you see
The Apiary for th'industrious Bee.
Walk on a little farther, and behold
A pleasant Garden, from high Winds and Cold
Defended (by a spreading fruitfull Wall,
With Rows of Lime and Fir-trees streight and tall,)
Full fraught with necessary Flow'rs and Fruits,
And Natures choicest sorts of Plants and Roots.
Beyond the same are Crops of Beans and Pease,
Saffron and Liquorice, or such as these;
Then Orchards so enricht with fruitful store,
Nature could give (nor they receive) no more:
Each Tree stands bending with the weight it bears,
Of Cherries some, of Apples, Plums, and Pears.
Not far from thence see other Walks and Rows
Of Cyder-fruits, near unto which there flows
A Gliding Stream, The next place you discover,
Is where St. Foyn, La Lucern, Hops and Clover
Are Propagated: Near unto those Fields
Stands a large Wood, Mast, Fuel, Timber yields.
In yonder Vale, hard by the River, stands
A Water-Engine, which the Wind commands
To fertilize the Meads; on th'other side
A Persian-Wheel is plac'd, both large and wide,
To th'same intent: Thendo the Fields appear
Cloathed with Corn and Grain for th' ensuing Year.
The Pastures stockt with Beasts, the Downs with Sheep;
The Cart, the Plough, and all good order keep:
Plenty unto the Husbandman, and Gains
Are his Rewards for's Industry and Pains.
Peruse the Book, for here you only see
The following Subject in Epitome.*



Systema Agriculturæ;

The MYSTERY of HUSBANDRY

DISCOVERED.

Treating of the several New and most Advantagious Ways

OF

Tilling, Planting, Sowing, Manuring, Ordering, Improving

Of all sorts of

GARDENS, MEADOWS, CORN-LANDS,
ORCHARDS, PASTURES, WOODS & COPPICES.

As also of

FRUITS, CORN, GRAIN, PULSE, NEW-HAYS, CATTLE,
FOWL, BEASTS, BEES, SILK-WORMS, FISH, &c.

With an Account of the several INSTRUMENTS and
ENGINES used in this PROFESSION.

To which is added

KALENDARIUM RUSTICUM:

OR,

The HUSBANDMANS Monthly Directions.

ALSO

The PROGNOSTICKS of Dearth, Scarcity, Plenty, Sicknefs, Heat,
Cold, Frost, Snow, Winds, Rain, Hail, Thunder, &c.

AND

DICTIONARIUM RUSTICUM:

OR,

The Interpretation of RUSTICK TERMS.

The whole WORK being of great Use and Advantage to
all that delight in that most NOBLE PRACTISE.

*The Fourth Edition carefully Corrected and Amended, with one whole Section
added, and many large and useful Additions throughout the whole Work.*

By J. W. Gent.

Virgil.

*O fortunatos nimium, sua si bona norint,
Agricolas.*

London Printed, and are to be sold by John Taylor, at the Ship
in St. Paul's Church-Yard, MDCXCVIII.

Systema Agriculturae The MYSTERY of HUSBANDRY DISCOVERED.

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Telling, Plowing, Sowing, Mowing, Ordering, Improving

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Virgil. O fortunatos nimium, sua si bona norint.

LONDON, Printed and are to be sold by Nath. Wells in Portico
near Mill, near the North side of St. Paul's Church 1697.

TO THE
GENTRY
AND
YEOMANRY
OF
ENGLAND.

SIRS,
 O you formerly was Dedicated the First Edition of this succeeding, though then imperfect *Treat*; and for your sakes principally did it then submit it self to the Censure of this *Critick Age*. It's now a bad time for so mean and *Rustick* a *Subject* to appear again, when every *Shop* and *Library* is repleat with the *Fruits* and *Labours* of the most *Acute Wits*. Yet I hope it may obtain a better Welcome than heretofore, being Revised and Corrected, in many places Enlarged, and many new and necessary Experiments and Observations added: You also being every day more and more addicted to this Noble, though heretofore neglected *Science*; as is manifest from the Effects in most places discernable: It being easy for a *Passant-Traveller* to distinguish the *Villa's* of the Ingenious from the Slothfull, by the Improvements made in them; some being well Manured, and
Planted

To the Gentry, &c.

Planted with many curious plantations of Fruit, and Avenues of Timber and other Trees, when others are bare and naked, to the shame and Ignominy of their Owners. I hope what I formerly wrote on this Subject, might be some inducement towards such improvement, amongst the many Elaborate and more Excellent Works: And I question not but this Fourth Edition, so much Enlarged, may more encourage and assist you in the Culture of your Farms to your best advantage, in the propagating and increasing of such things that may most retaliate your Cost and Industry, and most improve your Lands, not only for the benefit of your Selves and Posterity, but the Kingdom in general; the several ways and means to accomplish the same, being here presented to your view, well Pruned and Advanced. For which end, and no other, these Experiments and Observations have been not with a little care composed, and contracted into so convenient and brief a Method, and in such a familiar Stile, suitable to the apprehensions of those they most concern; and now also made more useful, that they may answer your expectation; which is the desire of

J. W.

Virgil — *Laudato ingentia Rura,*
Exiguum colito. —

P R O.

PROOEMIUM

In Laudem *AGRICULTURÆ*,

BEING

The *PREFACE* or *INTRODUCTION* to the

WORK

Shewing the *EXCELLENCY*, *UTILITY*, and *NECESSITY* of

HUSBANDRY.

THIS is an Age, wherein to commend or extol an Ingenious Art or Science, might be esteemed a needless Labour, especially in a Country so highly improved in every thing; but that we find the more Noble, Advantagious, Useful, or Necessary any Art, Science, or Profession is, the stronger Arguments are framed against it; and more particularly against this Rustick Art, and its infinite Preheminences and Objections, by the vainer and more Pedant sort of persons, despising the worth or value of what they are ignorant of, who judge it below their Honour or Reputation, to take any notice of so mean a Profession; that esteem the Country no other than a place for Beasts, as Cities for Men. This makes us tread in the steps of more worthy Rustick Authors, and give a short Preface, not to seek Credit of the Envious, but to satisfy or confirm the Ingenious of the excellency, and inestimable value of this Art, not only for exercise and health of our Bodies, the increase of our Fortunes, and our universal Benefit, Use and Advantage, but also for the Tranquillity and Peace of our Minds, and improving our understandings; which they will assuredly find do proceed from such Noble, Pleasant, and necessary Enterprises. If they diligently read and peruse the Antient Writers, they may observe that many Wise and Learned Men, worthy of Praise, were exceedingly delighted, not only in a Rustick Habitation, but did always exercise themselves in Tilling the Earth. That the Study of Agriculture was of so high an esteem, and so worthy of Honour, that Poets, Philosophers, Princes, and Kings themselves, did not acquire an Honourable and an Immortal Name, by their Writings and Precepts, in this Art left to Posterity; but have also diligently performed the Office of a Countryman, and wrought with their own hands, and obtained thereby not a little Fame and Renown. For which cause Xenophon in his *Elegant Treatise of Oeconomics* tells you, That nothing can be of a more Regal (or Noble) Estimation and Splendour, than Judicious Agriculture. Socrates also gives you a Relation, how Cyrus that most Renowned King of Persia, a man of a sublime Wit, and most Illustrious Fame, when Lyfander of Lacedemonia, a man endowed with excellent Virtues, came and brought him Presents, at a certain time, for their Recreation, he conducted Lyfander into his Garden, on every side enclosed with a noble Fence, and cultivated with most various Art and singular Industry. Then Lyfander (admiring the compleat order

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of every thing, and the height of the Trees planted in such direct lines, and every way lineal, the Earth adorned with Plants, the fairness of the Fruits, the Beauty and order of the pleasant and fragrant Flowers) said, That he did exceedingly admire, not so much at the Study and Diligence, as the Industry and ingenuity of the Workman, by whom the same was so artificially ordered and contrived. Then Cyrus being well pleased with the praise and commendation of his Workmanship, answered Lyfander: All these things were Performed by my own Industry; these curious Orders were by me delineated; these Trees, Plants, Flowers, and all these things thou so admirest at, were all Planted and performed by my own hands. Then Lyfander beholding his Purple Habit, the Excellency of his Person, and his Persian Ornaments glittering with Gold and Precious Stones, said: O Cyrus! how deservedly may you of all men be esteemed happy, seeing so high an Honour and Fortune is conjoynd and united with so excellent a Spirit.

Pliny writes, That the Romans had so high an Esteem for Agriculture, that their Laws did extend to the Reformation of the negligence and abuses in the exercise of that necessary and honourable Art. The same Author brings several Precedents of many worthy and honourable Persons that addicted themselves unto, and effected this Art; and highly sets forth the Praise and commendation thereof; and shews how the Ancient Romans did execute their Rustick Laws, and encouraged the industrious and ingenious Husbandman: as by the example of C. Furius Cretinus, who out of a small piece of Ground gathered much more Fruits and Profits, than his Neighbours about him out of their great and ample Possessions; which highly contracted their envy and hatred against him, insomuch as they accused him, that by Sorcery, Charms, and Witchcraft, he had transported his Neighbours Fruits, Fertility, and Increase, into his own Fields; For which he was ordered by Spurius Albinus peremptorily to answer the matter. He therefore fearing the worst, at such time as the Tribes were ready to give their voices, brought into the common place his Plough, and other Rural Instruments belonging to Agriculture, and placed them in the open face of the Court. He set there also his own Daughter, a lusty strong Lass, and big of Bore, well fed and well clothed; also his Oxen full and fair: Then turning to the Citizens of Rome, My Masters (quoth he) these are the Sorceries, Charms, and all the Incantments that I use: I might also alledge my own Travel and Toyl, my early Rising, and late Sitting up, and the painfull sweat I daily endure; but I am not able to present these to your view, nor to bring them with me into this Assembly. Which when the people had heard, they unanimously pronounced him Not Guilty; and he was highly commended of all persons for his Ingenuity and Industry.

It is most evident, that this Art of Agriculture doth not require so great charge and expence, as it doth Judgment, Labour and Industry: which is possessable with little, and advantage them unto, is the intent and scope of our Learning, both Ancient and Modern Authors, that we may not spend the best of our times in the most vain, costly, unnecessary and trifling Studies and Affairs; for in former times (Cato testifies) he was highly commended and praised that was esteemed a good Husband. It cannot be thought that so Learned and Wise Men could set so high a value and esteem upon the Art of Agriculture, but upon very solid and weighty grounds and reasons. Not to speak of the various Delights, Pleasures, and Contents that these Rustickes plentifully heap upon us, they supply us for our Necessities and advantages; for without this we cannot in City or Country doubt subsist: as the Mother suckles the Infant with her Milk, so doth the Earth, the Mother of us all, universally feed and nourish

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nourish us at an easie, liberal, and profitable rate; whereof we have daily experience, that our industry, labour and Costs, are rewarded upon us with a manifold encrease and advantage, unless the Celestial influences impede. Chrysostom also shews how necessary the Art of Agriculture is, when enumerating the several advantages of Mechanick Arts, at length concluding, that this Art is by far more worthy, excellent, and necessary than all the other. We all know how ill we can subsist without Garments and other necessities of that nature; but without the Fruits and other Encrease of the Earth we cannot live. The Scythians, Hamaxobians, and Gymnosophists, esteemed all other Arts as vain and unprofitable; but this Art of Agriculture they accounted the only necessary for human life; they exercised and applied all their Industry, Ingenuity, Practices and Studies, principally to this only Art.

Romulus and Cyrus knowing the necessity and usefulness of this Art above all other Exercises and Arts, did first institute or introduce their Subjects in Military Affairs and Agriculture, judging these only sufficient to protect and defend them from the injuries of others, and to sustain their lives. We also read, that the Helvetians or Switzers, a very wise people, their management of Affairs, inhabit or possess about an hundred Towns, one of which they yearly send a thousand chosen men into their Army, the rest remain behind to Till the ground. The next year some of them that stay go forth to the War, the other Return; by which means they are as well exercised in War as in Husbandry. It is also noted of Romulus, that he used to prefer Husbandmen above Citizens, esteeming those that lived in Towns with their wealthy Stocks and Trade, not equal nor worthy of compare with those that Tilled the Land, and wearied themselves daily in Rustick Exercises. The Romans, when they gave names to their Tribes, called the chiefest of the State the Rustick Tribe, and the weaker in degree the Urbane.

Numa Pompilius, to encourage Agriculture, commanded the Fields to be divided into a certain number of Villages, in each of which he constituted a Supervisor; whose principal Office it was to observe and enquire, who diligently and industriously did Till their Land, and who neglected it, whose Vices were brought unto him. He oftentimes called for the Industrious Husbandman, and courteously received him, and sometimes dismissed him with Noble Gratuities. And contrariwise, the idle and slothfull he rebuked; whereby some for fear of shame and disgrace, the rest to hope of favour and reward, were all continually intent on their Affairs, that they might render themselves and their Lands praise-worthy to their King; A worthy and noble Profession for the encouragement of our English Husbandmen that are ingenious and industrious, and for the Regulation and Reformation of the infinite mischiefs, injuries and neglects so frequently committed and suffered in every Village, by the slothfull, ignorant, and envious Rustick. These Examples we find in several Countries, as Spain, Germany, Venice, Holland, &c. of Compulsive Laws, and excellent Customs for the Propagation of Trees for Timber and for Fruits. In Burgundy, where Walnut-Trees abound, whatsoever they fall or die, they always plant a young one near that place: And in several places betwixt Hanaw and Francfort in Germany, no young Farmer is permitted to marry a Wife, till 3 years he bring Proof that he hath Planted, and is a Father of such a stated number of Walnut-Trees; which Law is inviolably observed to this day. It hath been a long time designed, and attempted by several worthy persons, effecters of ingenuity, and the publick good of the Kingdom, that there might be some Constitutions or orders for the advancing and propagation of this noble Art, especially that part relating to the encrease and preservation of Timber and Fruit-Trees; and that there might be judicious and experienced Superintendants in every place

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place for that purpose. I must needs confess we have several good Laws relating to our Rural Affairs, but none more slighted nor neglected then those. Our hopes and expectations are now great, that something will shortly be done therein, seeing that Royal and most excellent Society at Gresham Colledge make it one of the most principal Objects of their Studies and Care; it being so universally necessary for our well-being and preservation, if not the most necessary, all things considered.

Maximus Tyrius, a most Grave Philosopher, composed a Dialogue, wherein with many sufficient and firm Reasons, he demonstrates, that this Art of Agriculture hath the Precedency of, and is more necessary than the Military; and Elegantly and Learnedly discusseth many things, and very much of the Profits and Advantages of the Rustick Art, and Rural Affairs.

As to its Antiquity, no Art or Science can precede it; every one knows that a Country-life was the most ancient, and that men did in the Infancy of time inhabit in Country Habitations, and sustained themselves by the Fruits of the Earth, and dwelt in Tents, Woods, &c. instead of Houses.

As to the state, qualification, and condition of a Country-life, we may confidently maintain, that it far excells the City life, and is much to be preferred before it. Plato affirms, that a Country-life is the Mistress, and as it were the Pattern of Diligence, Justice, and Frugality; that he could find nothing more profitable, pleasant, or gratefull, than to live in the Country remote and free from Envy, Malice, Calumny, Covetousness, and Ambition: which occasioned this Grave Author to ordain several peculiar Laws relating to this noble Art, which were brought unto and confirmed by the Emperor Justinian, &c.

1. De Officiis

Cicero discoursing of the Utility of several Arts, at length concludes, that of all things necessary and usefull, nothing is better, more advantageous, stable, pleasant, nor more worthy a Noble, and Ingenious Spirit, than Agriculture, &c. Virgil also had as high an esteem thereof, and did very much extol and celebrate this Rustick Art; insomuch that when he was almost lost amongst the pleasant Groves, and rambling on the Felicities the Country yielded, he brake forth into this expression.

O Fortunatos nimium, sua si bona norint,
Agricolae; quibus ipsa procul discordibus Armis
Fundit humi facilem victum iustissima Tellus.

And Horace in a certain Ode sings thus.

Beatus ille qui procul negotiis,
Ut prisca gens mortalium,
Paterna Rura, Bobus exercet suis,
Solutus omni fenore, &c.

Also bear the Divine Du Bartas in his commendation of Husbandry.

O thrice, thrice happy he who shuns the cares
Of City-Troubles, and of State-affairs;
And serving Ceres, tills with his own Teem,
His own Free-land left by his Friends to him.

The Pleasures and Objections are superabundant and infinite which we daily enjoy and receive from the verdant Fields and Meadows, from the sweetness and beauty of the Flowers, the springing Woods, the delicate Fruits, and

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and the variety of Domestick and pleasant Animals educated even to the very hand, and from the various and harmonious Notes of the Nymphs of the Woods.

The winged Fancies of the Learned Quill,
Tell of strange Wonders, sweet Parnassus Hill,
Castalia's Well, the Heliconian Spring,
Star-spangled Valleys where the Muses sing.
Admired things another story yields,
Of pleasant Tempe and th' Elysian Fields;
Yet these are nothing to the sweet that dwells
In low-built Cottages, and Country Cells, &c.

We may well admire at such as are not highly delighted at the prospect of the most of our Country Villages, whose Beauty and Lustre daily encrease (where their Inhabitants are Industrious) and appear more and more neat, adorned and enriched, and in every part yield innumerable of pleasant and fruitfull Trees. Can there be a more ravishing and delightfull object, than to behold the Towns Planted with Trees in even Lines before their doors, which skreen their Habitations from the Wind and Sun, where they may sit or walk under the dark shadows of the Woods and Groves, and where are either the gliding Streams, clear and bright Rivolets, pleasant Hills, or shadowy Valleys, delightfull Meadows, or other the like Oblectations?

Fair, firm, and Fruitfull; various, patient, sweet,
Sumptuously cloathed in a Mantle meet,
Of mingled colour, lac't about with Floods,
And all Embroidered with fresh Blooming Buds.

That the highest and most absolute Content any man enjoys or finds in any Sublunary thing, is in this Science of Agriculture; and the several Branches and Streams of Pleasure and Delight proceeding or flowing therefrom, none but such as are ignorant thereof will deny. Of such that affirm it, we could produce infinite of Testimonies; also of many that so highly affected this Art and Life, that they deserted their Powers, Dignities, Kingdoms, Victories, and Triumphs, and wholly applied themselves to Agriculture and a Rustick Habitation; some whereof we shall here instance, as Manlius Curius Dentatus, who after he had not only Conquered the Warlike King Pyrrhus, but had expelled him out of all Italy, and had three several times Triumphed with Glory and Renown, and had very much enlarged the Roman Empire by his honourable Atchivements, returned with infinite Affectation, and very joyfully to his former Exercises and Rusticities; and there concluded the residue of his days with much Tranquility of mind and rest. No less delight did L. Quintus Cincinnatus take in that Country life, who when he was called by the Roman Senate to the Dictatorship (an Office of very high Dignity) was found at Plough in a rude and dirty habit or condition in his little Farm; and after he had obtained his freedom from the Office, he immediately returns to his Rural Occupations.

Also Attalus, that Rich Asian King, who left his Regal Dignity, and resigned his Empire, was then so intent on Agriculture, with such incessant care and diligence, that he formed, Planted, and contrived several peculiar Gardens, by his own singular Ingenuity and Industry. We must not omit Dio-
clesian

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clesian the Emperour, who left the troublesome Empire, and affecting a private Life, betook himself to the Country; and there lived a long time, and enjoyed the Experience, and reaped the fruits of most pleasing Tranquillity and happy rest. And although he was oftentimes invited and solicited by Letters and Embassadors from the Senate to return again to his Empire, yet could he never be tempted away from his beloved Village.

We read also of that most excellent person Attilius Calatinus, who for his singular Virtue was called from the Plough and Harrow to be a Dictator; yet still so persisted in his pleasing Frugality and Parsimony, for the great love he bore to Agriculture, that he rather chose to live privately in the Country, and to weary himself with digging and Ploughing his Land, than to be a Prince of the Romans, and possess the highest place amongst the Senators.

And likewise of Abdolonymus, who from a poor Gardiner (yet of Princely Race) was chosen to the Crown of Sidon.

Noah the Just, Meek Moser, Abraham,

(Who Father of the Faithfull Race became)

Were Shepherds all, or Husbandmen at least,

And in the Fields passed their days the best.

Such were not yerst, Attalus, Philemetor,

Archealus, Hiero, and many a Pretor:

Great Kings and Consuls, who oft for Blades

And glitt'ring Scepters, handled Hooks and Spades?

Such were not yerst, Cincinnatus, Fabricious,

Serranus, Curius, who un-self delicious,

With Crowned Coulters, with Imperiall hands,

With Ploughs triumphant plough'd the Roman Lands.

How much Honour were Piso, Fabius, Lentulus, and Cicero worthy of, who invented and brought into use the Commodious way of sowing of the several Pulses that from that time have born their Names? We must not forget our Famous and most ingenious Countrey-man the Lord Verulam, a Person, who though much concerned in the publick Affairs of the Kingdom, yet spent much of his time and Studies in the diligent scrutiny of the Nature and Causes, and proposed means for the advancement and propagation of this part of Natural Philosophy; as his Sylva, and several other of his Works testify.

Many other Examples of this Nature might here be inserted: But these, together with the multitude of the like Presidents, our Age and Countrey affords us, as well of the Industrious and most judicious Operations of our Nobles and Gentry in these Rusticities, as of their Noble and pleasant Pallaces, and Rural Habitations; and the Contentments and Delights they place in them, may be sufficient to convince all ingenious Spirits that are not prejudiced against this Art, not only of the Dignity, Pleasure, and Delight thereof, but of its Utility and Necessity.

Here they enjoy all things necessary for the sustentation of Life, and are freed from the perturbations, cares and Troubles, that in other places disturb the mind; and live content with their Lot, in tranquillity and moderation of Spirit. Here they enjoy

Rest secure, an innocent Life in Peace,

Variouly Rich, in their large Farms at ease.

Tempe's cool shades, dark Caves, and purling Streams,

Lowings of Cattel, under Trees soft Dreams;

This

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This Country-life improves and exercises the most Noble and Excellent parts of our Intellects, and affords the best opportunities to the insatiable humane spirit to contemplate and meditate on; and to penetrate into, and discover the obscure and hitherto-occult Mysteries and Secrets of Nature; the fixity or Mobility of the Earth, the nature of the Air, its weight, and divers Mutations; the Flux and Reflux of the Sea; the Nature and Matter of Comets, Meteors, &c. the Mystery of Vegetation; the Nature of Animals, and their different Species; the discovery and improvements of Minerals, and to attain the highest perfections in Science and Art: yea, this condition capacitates a Man to the study and practise of the most secret and mystical things Nature affords, if adapted thereunto.

That there is no place so fit for such a study or contemplation of Natural Philosophy, or any of the Liberal Arts, Plato the Prince of Philosophers testifies by his deserting Athens, that splendid City, and erecting his Academy in a remote and Rustick place. Also Petrarchus, for the quietude and solitariness of that kind of Life, was so much delighted therewith, that he most pleasantly spent those years he lived, alone in a secret Valley; which caused him so often to invite his Friends to come and enjoy with him the contentments of so nappy and gratefull a Countrey life, as it appears by many of his Epistles. Our Modern Rapius, imitator of Virgil in his Learned Poems on several parts of this Rural Art, breaks forth into these Expressions (as they are translated by a judicious Hand.)

“Who could be so unkind as to perswade,
 “I should for th’Town forsake my Countrey shade?
 “Such Joys I’ll ever love, and should be glad
 “At thole delightful Rivers to be staid.

Afterwards in the same Poems.

“And blest is he who tired with his Affairs,
 “Far from all noise, all vain applause, prepares
 “To go, and underneath some silent shade,
 “Which neither Cares nor anxious Thoughts invade;
 “Do’s, for a while, himself alone possess;
 “Changing the Town for Rural Happiness.

With much more in praise of this most pleasing Life.

You will also find, that all Studios and Learned Men have exceedingly delighted in a Solitary and Rural Habitation, and to have much preferred it: for besides the serenity of the Air, and the pleasing Viridity, which much quickens the Genius, it is most certain that the Spirits also are thereby recreated, and the Intellectual parts wonderfully acuated; as the same Patarcha says:

Hic non Palatia, non Theatra, nec atria,
 Sed ipsorum loco Abies, Fagus, & Pinus,
 Inter herbas virentes, & pulchrum montem vicinum,
 Unde & Carmina descendunt, & Pluvia,
 Attolunq; de terra, ad sidera nostram mentem.

By

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By which it is most apparent, that the Study of Arts and Sciences, and the exercise and fruition of a Countrey-life, are of so near a Resemblance, that they may both be practised without impeding each the other.

This Rustick life also most certainly hath the Preheminence above the Habitations in great Towns and Cities; for that it yields a perpetual Rotation of its infinite variety of Oblectations and Contents, as the various times and seasons of the year with a pleasing Pace successively present themselves. Sometimes the Spring approaches, the most certain forerunner of the Summer; all Trees then exercising, as it were, a mutual Emulation, which should be arrayed with the most verdant Leaves, and adorned with the most excellent and curious blossoms; that they afford (besides most fragrant Odours every way breathing from them) incredible delight and pleasure to all. To these may you add the pleasant Noises of the Charming Nymphs of the Woods, singing their amorous Ditties, ravishing our Ears with their sweet Harmony. Then follows the Summer, adorned with various Flowers, the Lilly, the Rose, the Gilliflower, and infinite other most curious and pleasant; and also several delightful Fruits, Animals, and other necessities for Humane use. Then also succeeds the Autumn or Harvest, wherein we reap the Fruits of our past Labours: then doth the Earth discharge it self of its infinite variety of its Grain and Pulse, and the Trees of their Delicacies: then also doth the Air begin to wax cool, to recollect and refresh our spirits, before debilitated with too much heat. At length enters cold Hyems, which of all the rest conduces most to the Health of our Bodies: for then our superfluous Humours are with Cold compressed, or else concocted; and the Natural Heat being the more concentrated, renews its power, and more easily performs digestion; and expelling Obnoxious humours, as Philosophers say, Powers united are of greater force than dispersed; so then are we more firm, active, and strong. The end of Winter gives a beginning to the subsequent Spring: Anus in Angue latet; so are the Rural Pleasures and Oblectations renewed ad Infinitum.

The Heathens of old had also a very high esteem of Agriculture, as appears by their several Gods and Goddesses, whom they judged had a Tutelar care over those Fruits of the Earth, and other things under their Tuition; as Bacchus, Ceres, Diana, Saturn, Flora, Pales, and several others. But leaving them, we find many Learned Men, of profound parts, and most excellent Ingenuity, to have taken delight, and to have been very studious in this Art; as Cicero, who so highly affected and esteemed these Rusticities, that (amongst several other Rural Habitations, wherein he took much delight) he was so well pleased with the pleasant Scituation of the Tusculan Fields or Country, as there to institute as it were another Academy, and compose those Philosophical Questions, which from the place he named Tusculan. Cato the Roman Censor, and excellent Moralist, was wont to say, That he placed his whole Recreation and the universal Tranquility of his mind in the Exercise of Rural Affairs: therefore with infinite of pleasure and affectation did he inhabit in the Village Sabines, positively affirming, that a better and more pleasant life was not to be found. Seneca also was of the same Opinion, that he could tarry in no place more willingly than in his own Village; in which with a very great Art he brought an Aquaduct to Water his Gardens. What shall we say of Varro, Palladius, and Columella, who published so many useful and profitable Precepts

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cepts of Agriculture, and so industriously exercised and delighted themselves in a Rustick life? We might produce many more instances of most honourable, learned and worthy Persons, who rather elected and preferred to spend their remaining days in the Country, than in the most pompous Pallaces and Cities, but that we judge it needless. Such that desire to hear more, we refer to Pliny, and other Authors more Copious in Historical Relations.

It is for no other reason that Gardens, Orchards, Partirres, Avenues, &c. are in such request in Cities and Towns; but that they represent unto us Epitomized, the Form and Idea of the more ample and spacious pleasant Fields, Groves, and other Rustick Objects of Pleasure. Formerly Gardens were not in Cities and Towns, but in Villages without, as Pliny witnesseth, untill Epicurus (the Doctor and Master of Pleasure and Voluptuousness) first Planted them in Athens; which was afterwards imitated and brought into use by such who loved their pleasures. Gardens, wherever planted, were always in esteem; as the Famous Gardens of Adonis and Alcinous, and those Horti Penfiles of Semiramis Queen of Babylon, or Cyrus King of Assiria, elevated so high from the Earth on Tarraces and other Edifices, that they were numerated amongst the most stupendious and wonderfull works that were in the world. Also that Renowned and Fictitious Garden of the Hesperides, Hieroglyphically and Philosophically representing unto us the Summary of eternal Atchievements or Enjoyments. The Romans also made great store of Gardens, and placed great pleasure in them. We must not forget the singular care and industry of the Egyptians in Tilling their Gardens; wherein, by reason of the temperature of the Air, the goodness of the Earth, and their exquisite Industry, flourish and grow throughout the year, the green Herbs, and infinite variety of pleasant Flowers. How many rare and excellent Gardens, and places allotted and designed for Pleasure are in every part of this Kingdom, and in our Neighbouring Countries; but more especially in Renowned Italy, the Garden it self of the World? The great Study, Care, Ingenuity, Cost, and Industry bestowed and employed about them, are Arguments sufficient to convince the greatest Antagonist of the infinite contentment and delight they had and enjoyed in Agriculture, and those kind of Rural Exercises: the commendations whereof, the great advantages, oblectations, and its universal uses and pleasures are so many, and so tedious to enumerate, that it requires an eloquent Pen, and an expert hand to discover them, and not to be crowded into so narrow a confine as a Preface. More you may read in several Authors of its Praise, Practice, and Worth; as Horace in several of his Poems hath written in the Praise of Agriculture and a Country-life. In Tibullus also you have one of his Elegies full of praises and delights of a Country-life. So Angelus Politianus his Sylva Rustica, and Pontanus his second Book De Amore Conjugali: Also Cicero, in his Book De Senectute, writes in praise and Commendation of the Country, and of Agriculture; where he says in one place, Venio nunc ad voluptates Agricolarum, quibus ego incredibiliter dilector, &c. Du Bartas in his Divine Poems, omits not the praise of this, as most praise-worthy. But Virgil hath more fully and amply set forth its praises and commendations in his Georgicks, where he treats particularly of that Subject; and doth not only recount the pleasures and profits that proceed from it, but very learnedly and ingeniously Treat of the Art it self, and gives many Precepts which are necessary to be observed in the exercise of Agriculture, which renders it more delightful and beneficial. Hesiod also, one of the prime Poets amongst the Ancients, hath written an excellent exciting and necessary Poem treating of
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this Art. Several others there are that have copiously and learnedly treated on this Subject, amongst whom Rapinus before-named pleasantly sings the excellency of several parts of Agriculture, and of the Art it self.

Also a most evident demonstration and sure Argument of the Utility, Pleasure, and Excellency of this Branch of Natural Philosophy, is the principal care the Royal and Most Illustrious Society take for the advancement thereof, and for the discovery of its choicest and rarest Secrets, and the most facile and advantageous means to improve the several Experiments and Practises relating to that Subject; as the ever-honoured Mr. Evelin, a most worthy Member of that Society, in particular hath done on one of the most principal parts of Agriculture; viz. the Planting of Trees both for Timber, Fruits, and other necessary uses, and of making that incomparable Liquor, Cider.

But nothing could more conduce to the Propagating, encouraging, and improving of this most necessary Art, and of all other Ingenious and Mechanick Art, Inventions, and Experiments, than the Constitution of Subordinate Societies (after a Provincial manner) in several places of the Kingdom, whose principal care and office might be to collect all such Observations, Experiments, and Improvements they find within their Province, relating to this or any other Art within their Inquiry; which particular Societies might Annually impart such Collections, Observations, Experiments, and Improvements that they have obtained, to the Grand Society; and from them also might Copies or Duplicates of the whole Collection be Annually transmitted to each subordinate Society, that any person may have a place near unto him for the discovery of his Observations, Experiments, Inventions, or Improvements; and that diligent, industrious, and ingenious persons may have recourse thereunto, for the enquiry and search into the several Inventions, Discoveries, and Improvements of others; by which means every person may have an opportunity to publish or discover his Observations, Experiments, &c. which otherwise have been, and will be, for the most part, with their Authors buried in oblivion; and every one may also have the like opportunity or advantage to search into, or enquire after the several Ways, Methods, Inventions, &c. used or discovered in any other place of England, of such things relating to this Society; which of necessity must abundantly improve Science and Art, and advance Agriculture, and the Manufactures, two of the principal Supports of this Nations Weakness and Honour.

That the particular proceedings (already made known) of that most Illustrious Society, and the more universal much desired and expected from them, (next unto the publick Peace and Tranquillity of the Nation) are esteemed the only ways and means to promote Industry and Ingenuity, to employ our numerous people, to cultivate our waste Lands, to convert our barren Fields into fruitful Gardens and Orchards, to make the Poor Rich, and the Rich Honourable, every man is willing to assist in so Universal a Work (unless those who thrive by others Ruines.) We find many have acted their parts, and discovered to the World what they apprehended or had the experience of; which though much short of what may be done, yet have they not lost their Aim. Many by their Rules, Precepts, Observations and Experiments, have highly advanced this Noble Science of Agriculture. But seeing some of those Treatises are relating to particular Countries or places, or to some branch only or part of this

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our Subject, and those also difficult to be obtained, and many of them filled with old obsolete and impertinent directions and things, and too voluminous for our Laborious Husbandman, whom they principally concern, I thought it no time ill spent in such times and hours, as other necessary Affairs detain me not, to collect such usefull Observations, Precepts, Experiments, and Discoveries, which I find dispers'd in the several Authors Treating of this Subject. and to reduce them into the following Method; omitting such things as have been found to be useles, false, or merely putative or conjectural, or relating to other Climates; and adding also such Discoveries, Observations and Experiments as I have obtained from others, and my self discovered, and never before published by any. You have here Epitomized the Substance and Marrow of all or most of the known Authors treating of this Subject, or any part thereof; and also such new and necessary Observations and Experiments as are for the benefit and improvement of our Country Habitations, Which hope may gratifie such Readers as desire a work of this nature, until our Philosophers and Heroes of Science and Art handle the Plough and Spade, and undertake the more plenary Discovery and Description of these Rustick Operations; which indeed require not only an experienced Hand, but a judicious and ingenious Pen: until when, I hope this indigested Piece may find a place in our Rural Libraries; and then I shall willingly be the first that shall commit this to the Flames, to give way for a better; which that we may suddenly obtain, is my earnest desire.

V A L E

A

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C H A P. I.

Of Husbandry, & Improvements in general; plainly discovering the Nature, Reasons, and Causes of Improvements; & the Growth of Vegetables, &c.



Agriculture hath been (not undeservedly) esteemed a Science, that principally teacheth us the Nature, and divers Properties and Qualities, as well of the several Soils, Earths, and Places, as of the several Productions or Creatures, whether Vegetable, Animal, or Mineral, that either Naturally proceed, or are artificially produced from, or else maintained by the Earth. *Agricultura est Scientia docens, quae sunt in unoquoque Agro serunda & faciunda, quae terra maximos perpetuo provenius ferat, saith Varro.*

The Judicious & Understanding Husbandman must first consider the Subject whereon to spend his Time, Cost, and Labour viz. the Earth, or Ground; which we usually term either Meadow, Arable, Pasture, Woodland, Orchard, or Garden-ground: then whether it be more commodious or profitable for Meadow, for Pasture, or for Woods, which in most places are naturally produced, to the great advantage of the Husbandman; or with what particular Species of Grain Pulse, Trees, Fruits, or other Vegetables, it is best to Plant, or Sowe the same, to his greatest benefit; and with what Beasts, Fowl, or other Animals, to Stock his Farm or other Lands. Also he is to consider the best and most commodious way of Tilling, Improving, Propagating, Planting, and Manuring all such Meadows, Arable, and Pasture Lands, Woods, Orchards, and Gardens; and the Reasons and Causes of such Improvements. All which we shall endeavour to discover, to the satisfaction and content of the diligent and labourious Husbandman.

But before we enter upon the particular Ways and Methods of Agriculture Treated of in this ensuing Work, we shall endeavour to unvail the secret Mysteries (as they are commonly esteemed) of the Productions and Increase of Vegetables, after a plain and familiar Method, not exceeding the Capacity of our Husbandmen, whom this Treatise doth principally concern; by the true knowledge whereof a Gate is opened to Propagate, Maturate, or advance the Growth or Worth of any Tree, Plant, Grain, Fruit or Herb, to the highest pitch Nature admits of.

This Globe of Earth that affords unto us the substance, not only of our selves, but of all other Creatures Sublunary, is impregnated with a Spirit most Subtile and Ethereal, as it were *divinioris Auri particula* (as the Learned Willis terms it) which the Original, or Father of Nature hath placed in this World, as the Instrument of Life and Motion of every thing. This Spirit is that which incessantly administers unto every Animal its Generation, Life, Growth, and Motion; to every Vegetable its Original and Vegetation: It is the Vehicle that carrieth with it the Sub-

phureous and *Saline* parts, whereof the Matter, Substance, or Body of all Vegetables and Animals are formed or composed. It is the Operator or Workman, that transmutes by it's active heat the *Sulphureous* and *Saline* parts of the Earth or Water into those Varieties of Objects we daily behold or enjoy, according to the different Seed or Matrix wherein it operates: It continually perspires through the pores of the Earth, carrying with it the *Sulphureous* and *Saline* parts, the only Treasure the Husbandman seeks for, as hath been by some Ingenious Artists mechanically proved, by receiving the same between the *Vernal & Autumnal Equinoxes* in an Alembick head, where it hath condensed, and copiously distilled into the Receiver, at that season of the year; the Earth then more liberally affording it than in the Winter season: which Spiritual Liquor so received, is not a Treasure to be slighted or neglected, carrying with it the only Matter of Vegetables, as the same Artists affirmed, that having placed the same under a *Melon-Glass* near some *Vegetable*, it was thereby wholly attracted externally, and converted into that *Vegetable*; they concluded also the same to be that *Materia Prima que absq; omni sumptu, labore & molestia reperta est, & quam in aere capere se oportet antequam ad terram perveniat, &c.* This Liquor undoubtedly would be of singular Virtue and Effect, in advancing and maturing the Growth of the more excellent Flowers or Curiosities, being irrigated therewith. It is easily obtained, and that in great quantities, by such that think not a little time and labour lost, to scrutine into the Mysteries of Nature. But whether we obtain it singly, or simply, or not, this we know, that it is to be received by placing the more natural *Receptacles*, the Seeds and Plants in the Earth, which gives it us transmuted into such Forms and Substances, as are most desired and necessary.

of the Uni-
versal Sul-
phur.

De Fermen-
tatione.

Although the Spirit of *Mercury* be that active and moving part, and that principally appears in the Generation or Conception of any Vegetable or Animal, and is also the first that flies in the separation or dissolution of Bodies, yet is it imbecile and defective without that most Excellent, Rich, & *Sulphureous Principle*, which (according to the description of the Learned *Willis*) is of a little thicker consistence than the Spirit, and next unto it the most active; for when any mixture or compound is separated, the Spirits first fly, then follow after the *Sulphureous Particles*. The Temperature of every thing, so far as to the Heat, Consistence, and curious Texture thereof, doth principally depend on *Sulphur*; from hence every Plant, Fruit and Flower receives those infinite variety of Forms, Colours, Gusts, Odours, Signatures, and Virtues; it is that which is the proper *Medium* to unite the more Volatile *Mercury* or Spirit to the more fixed Salt. *Spiritus Mediante Anima cum corpore coniungitur & ligatur, & fit unum cum eis*, say the Philosophers. This *Sulphur*, or oily part, is easily separated and distinguished in *Vegetables* by the more curious: it ariseth out of the Earth with the aforesaid *Mercury* or *Aqueous Spirit*, though not at the first discernible, yet in every Plant more and more maturated and augmented by the Sun's influence, as the Seed or Matrix is more or less inclined to this Principle: This is also that which gives to our hot and stinking Dungs, Soils, or Manures the Oleaginous pinguidity and fertility, and which begets that fiery heat which is in Vegetables, as Hay, Corn, &c. laid on heaps not throughly dry.

of the Uni-
versal Salt.
Willis de fer-
mentatione.

Not only the Duration of *Individuals*, but also the Propagation of the Species dependeth much on the Principle of Salt: for the growth of

Mineralls

Minerals, the fertility of Land, the vegetation or growth of Plants, and chiefly the fruitful Foetation and Progeny of Animals, have their Original from their *Saline* Seed. This *Salt* obscurely passeth with the *Mercurial Spirit* and the *Sulphur*, and is associated therewith; wherever that passes, and where it finds a convenient *Receptacle*, *Seed*, or *Matrix*, it is more fixed then either the *Sulphur* or *Spirit*. The *Salt* is that which gives to every Creature a Substance or Body; without which, neither the *Spirit* nor *Sulphur* could be reduced or coagulated into any Form; It is in every thing: *Sal autem reperitur in rebus omnibus*. It is volatile when carried in the wings of the *Spirit* and *Sulphur*, by the natural Fire, or Motion: But afterwards it is more fixed, when separated from the *Spirit*, or *Mercury*, and *Sulphur* by artificial Fire, as appears in the ashes or *Caput Mortuum* of all *Vegetables*, *Animals*, or *Minerals* distilled or burnt; much also of the *Sulphureous* or *Mercurial* parts are coagulated by, or transmuted into the *Saline*, by natural or artificial Heat or Warmth, as is evident in the *Sea*, the nearer it is to the *Equinoctial* Line, and the more it receives of the Perpendicular, or direct Beams of the Sun, the greater quantity of *Salt* it contains, not only by the exhalation of the *Aqueous*, or *Phlegmatick* parts, but the Maturation, Transmutation, or Fixation of the more volatile, *Spiritual*, and *Sulphureous* parts, into the more *Saline* or fixed: For in those hotter *Climates*, the Land it self also is more fertile, through the abounding quantity of this vegetating *Salt*, as appears by the great plenty of *Nitre*, or *Sal terræ* found in the hotter *Climates*, lying on the Surface of the Earth in the morning like a hoary Frost: when the Regions nearer the *Poles* having not those natural advantages of the *Sun-beams* in so high a degree, are not so Fertile, nor abound so much with *Salt*, the most principal cause of Fertility. Some of our best and most ingenious Modern Authors, not only acknowledge, but affirm, some *Salt*, (meaning I suppose, the vegetating *Salt*) to be that which gives ligature, weight, and constitution to things; to be the most manifest Substance in all artificial Composts, and to be the Reviver, and fertilizer of dead mortified and barren Earth. And make a Querie, whether *Salt* hath not a Dominion almost Monarchical in this great work of Nature, being so absolute an ingredient in all our Dungs and Composts.

But we will leave these *Philosophical Principles* as they are simply and apart, very necessary to be known by those that operate in the more *Secret*, *Mystical*, and *Mechanick* Indagations of Nature, and discourse only of that Universal *Spirit* or *Vapor*, which daily and every moment perspires and proceeds out of every part of the Earth, and is in every thing, containing in it self the *Spirit* or *Mercury*, the *Sulphur* and the *Salt* in one body united: and without Art indivisible, yet some one Part or Principle abounding more or less in every thing; as the Water containeth more of the *Spiritual*, or *Aqueous* part; several *Fruits*, *Plants*, *Flowers*, and *Soils*, more of the *Sulphureous*; and *Barks of Trees*, *Blood of Animals*, and several *Minerals*, more of the *Saline*. And wheresoever these *Principles* are most equally tempered or mixed, there is most of Fertility, as is evident in the several Natures, Tempers and Qualities of Places, for the Production or Propagation of *Vegetables*; and wheresoever any or either of these Principles do over-much abound; Vegetables are not produced; as Waters or any other Liquors, or Spirits, are not Fertile in themselves as to Vegetation, unless they are either conjoyned with some other Substance or Matter, or the more *Phlegmatick* parts evaporated,

of the true matter of Vegetables.

Where Water of Spirits abound.

ted, and the remaining part maturated by the Sun or Air into an augmentation of the other *Principles*, then is it capable of yielding naturally some sort of Vegetables: For although several Plants set in Water only, do emit fibrous roots, and flourish therein for a time; yet is it meerly an attraction of the most *saline* and *sulphureous* parts or *Principles* to it's own relief, as is evident by it's better thriving, if the Water be often changed: At best, this nourishment is but weak, having so little of the *Sulphur* and *Salt*; as the *Withy*, *Poplar*, and other *Aquatick* Plants demonstrate. Therefore out of any sort of Waters, it is in vain to attempt any material or effectual increase of Vegetables, other than those that are naturally *Aquatick*, because they contain a superabundant Spirit or Moisture. Therefore vain is the new received Opinion that Trees and other Vegetables, and also other Minerals, proceed from Water only. But our *Spiritus Mundi*, or *Materia propinqua Vegetabilium*, although it appear in a Liquid form, yet it contains actually a due proportion of the three *Principles*: And the more any Substance or Matter is impregnated, or irrigated therewith, the more prone or apt it is to Vegetation; as Rain-water being animated with it, by the continual Exhalations, or Fumes, ascending from the Earth, and by it coagulated and detained, is more prone to Vegetation than any other Waters, only stagnated or prepared by the heat of the *Sun*, or exsiccating power of the Air, as you may perceive by Plants watered therewith, and by it's sudden Generation of Animals and Vegetables in the Spring-time, then the Earth more copiously breathing forth that *Spiritus Mundi*, which returned again, doth by the vivifying heat of the Sun, easily transcend into another Species. How soon will Horse-hairs receive life, lying in Rain-water but a few days in the heat of the Sun in the Spring-time! whereof I have seen many in the High-ways after Rain in the Month of *May*, very nimble and quick, that had not yet lost their shape of a Horse-hair. This is worthy our further enquiry, to what Period this may be advanced: it may also serve as an *Index* to point at several other Excellent Discoveries.

Therefore we cannot but explode that Opinion, That *ex aqua sola fiunt omnia*, although it be seemingly proved by many Arguments, and Experiments, as that all things are reducible by Art into Water, or a liquid form at least, which is no other than a solution of some Matter into a Liquidity, as Metals may be dissolved in their proper *Menstruums*, and reduced again into their former shape; Then have there been Experiments made of *Squashes* and *Cucumbers*, planted in baked Earth, and watered with water only. And after they have grown to such a bulke as the Experimenter thinks convenient, then are they weighed, and also the Earth, and its probable that the Earth is but little diminished, or not at all; from whence they conclude, that the substance of those Vegetables proceeded from the Water. Thus have Men made Experiments to speak as they would have them, to favour their new opinions they would impose on the credulous; not considering, that in case they dried or distilled those Squashes or Cucumbers, that the remaining parts of them would be but small or light, in comparison to what they were before; nor that the Earth had in it a part of those other Principles, notwithstanding the Drying or Baking of it, nor that the Water wherewith they watered them, had also its due proportion of the same Principles: For if such Experimenters had taken Earth that had been often percolated with

a barren Water, until it had extracted all its saline and fertile Principles, or Sand that never had much of them in it, and had planted the same sorts of Seeds therein, and had watered them with a light hungry Water, or Water, or Phlegme distilled from *Salt of Tartar, Calx Viva, Brick*, or any other matter that would detain the Salt and Sulphurous parts, and give you only the barren Phlegme, or meer Water, it's probable they would not find the same effect, as in the other Experiments; but be very apt to believe that there is somewhat besides Water, necessary in the composition of Vegetables, as some of them (formerly otherwise opinionated) have been so ingenious to acknowledge.

For all Vegetating or fertilizing Water is endowed or impregnated with that nitrous Spirit, especially those *Celestial Rains or Dews*, even *Snow* it self is not without it. *Rain-water* being that very *Aqua Celestis* Sir *Hugh Platt* prescribes his Vegetable *Saturn* to be imbibed withall, which by frequent imbibitions, and gentle evaporations exceedingly enricheth the Earth (his *Saturn*) by detaining or fixing that nitrous part of it, that maketh the Earth much more fit for Vegetation. *Snows* enrich the Earth, as is apparent by vulgar observation, not only by covering the Earth to preserve its Spirits in it self, but by the nitrous Spirit it leaves in the Earth, after its Solution. *Spring-Waters* are more or less fruitful, or vegetating, as they are more or less impregnated with that nitrous Matter in their passages through the bowels of the Earth; and standing Waters are more fertile than any, by reason of the constant waste of the Phlegmaticque vapour that constantly rises from it, leaving the more of the ponderous and fertile parts.

Therefore let our *Country-Husbands* conclude, that *Water* as it is simply Water, is an excellent Vehicle to convey the *Spirit, Salt, and Sulphur* that are apt for Vegetation into Vegetables, either by exhaling them, or so much of them as is volatile into the Air, and distilling them again on the Earth, or by extracting the same Principles out of the body of the Earth, in its passages, and then irrigating and fertilizing the surface of it. For without Water, or a very dense Air, the Principles of Vegetation cannot easily be insinuated, or convey'd in any other Matter requiring the same.

Neither is the more *Sulphureous* part or Principle of it self capable of yielding *Vegetables*, being of too hot and pinguid a Nature, as the Dung of Animals (and especially of Volatiles that eject no Urine, where by the more fiery and *Sulphureous* part of the others is diluted) containing much of that pinguidity, produceth no *Vegetables* of it self, unless commixed or allayed with some other Matter abounding with the other Principles, or that it loseth its too fiery destructive Nature, by being exposed to the Sun or Air, until it be evaporated, then will it emit several *Vegetables*: Of the like Nature also are the flesh and bones of Animals, yielding a very rich Compost, though of themselves (through over-much heat and pinguidity) sterile.

The *Saline*, or more fixed Principle, which is esteemed by most Authors the only thing conducing to Fertility, yet is of its self, or in an over-bounding quality, the most barren and unfruitful. It is prescribed as a sure way to destroy Weeds (*Vegetables*) by watering the place with Brine or Salt-water; yet what more fruitful, being moderately commixed with other Materials of another Nature, than Salt? But observe, that Salt's extracted out of the Earth, or from Vegetables, or Animals, are much more Fertile

Where Fatness
or Sulphur
abounds.

Where Salts
abounds.

Continuatio
Miraculi
Mundi.

Fertile than those of the Sea, containing in them more of the Vegetative Power or *Principles*, and are therefore much to be preferred. Glauber makes it the highest improvement for the Land, and for Trees also, affirming, that by it you may enrich the most barren Lands, beyond what can be performed by any other Soils or Manures, in case it be deprived of its Corrosive Qualities; for then will it naturally attract the other *Principles*, continually breaking out of the Earth, and in the Air, and immediately qualify it self for Vegetation; as I observed in a parcel of Field-Land of about three Acres, *Denshired*, or *Burnt beaten* in a very hot and dry Spring, of it self naturally barren, and after the burning and spreading the Ashes, where was the fertile Salt deprived of its Corrosive sterile quality, the Land was Ploughed very shallow, and Barly sown therein about the beginning of *May*, in the very ashes as it were (no Rain falling from the very beginning of cutting the Turf) yet in thirty and six hours was the Barly shot forth, and the Ground coloured Green therewith; this Salt extracting and condensing the ever-breathing *Spirit*. The like you may observe in Walls and Buildings, where several sorts of Vegetables, yea, Trees of a great bigness will thrive and prosper remote from the Earth, and without any other nourishment than what the Fertile Salt attracts and condenses, as before; which it could not have done, had it not been purged of its Corrosive and Sterile Nature by Fire, when it was made into Lime: For all *Chymists* know, that no Salts more easily dissolve *per deliquum*, than those that are most calcined. For the true vegetative Salt attracts the Celestial Dews, or Vapours unto it self, or else it condenses the Air into Water, whereby it becomes moist and fertile, which it could not be whilst it was dry, as is evident from the former examples.

The Salt also of the Sea, is not without its fertile Nature, being ordered with Judgment and Discretion, as we see evidently, that the Salt Marshes (out of which the Sea is drain'd) excel in Fertility: and many places being irrigated with the Sea Water, yield a notable increase; Corn also therewith imbibed, hath been much advanced, as appeared in the President of the Countreyman, that casually let his Seed-Corn fall into the Salt-water. And in the *Isle of Wight* it is observed, that Corn flourisheth on the very Rocks that are bedewed with the Salt-water by the blasts of the Southern-Winds. The Shells of Fish, being as it were only Salt coagulated, have proved an excellent Manure for barren Lands, after they have lain a competent time to dissolve. Yet nothing more injurious to Vegetation, than excess of this Principle.

Equal Com-
mixture of
Principles.

From what hath been before observed, we may conclude, that the highest Fertility and Improvements are to be advanced and made from the most due and proportionate Commixture of the aforesaid several *Principles*, or of such Waters, Soils, Dungs, Salts, Manures, or Composts, that more or less abound with every of them, having regard unto the nature of such *Vegetable*, whose propagation or advancement you intend: Some delighting in a more Hot or Cold, Moist or Dry, Fat, or Barren, than others. And next unto that, from due Preservation, Reception, and right disposing and ordering of that *Spiritus Mundi*, every where found, and to be attained without Cost, and as well by the Poor as Rich.

It continually breaths from the Earth, as we noted before, and is diffused in the Air, and lost, unless we place convenient Receptacles to receive it, as by Planting of Trees, and sowing of Pulses, Grain, or Seed.

Out

Out of what think you, shall these things be formed or made? Out of Rain-water is the common Answer or Opinion. But we experimentally find, that this *Universal Subject* gives to every Plant it's Essence or Substance, although assisted by Rain or Water both in it's nourishment and condensation.

We see how great a Tree is raised out of a small Plat of Ground, by it's sending forth of it's Roots to receive it's nourishment, penetrating into the smallest Crannies and Joynts between the Stones and Rocks, where it finds the greatest plenty of it's proper Food. We constantly perceive and find, that Vegetables having once emitted their fibrous Roots, vegetate and increase only from the assistance of this our *Universal Subject*, when the Earth wherein it stands is of it self dry, and not capable to yield that constant supply of Moisture the Plant daily requires. Although we must confess that Rain or other Water accelerates it's Growth, having in it a Portion of that *Spiritus Mundi*, and also better qualifies the Earth for it's perspiration.

That this *Subject* is the very Essence of Vegetables, and that from it they receive their Substance, and not from water only, is evident, in such places where Vegetables are not permitted to grow, and where it cannot vapor away, nor is exhaled by the Sun nor Air; as Under-buildings, Barns, Stables, Pigeon-Houses, &c. where it condenses into *Nitre*, or *Salt-Petre*, the only fruitfull Salt (though improperly so called) containing so equal and proportionable a quantity of the *Principles of Nature*, wholly Volatile, only condensed in defect of a due recipient; not generated, as some fondly conceive, from any casual Moisture, as Urine in Stables, &c. though augmented thereby, but merely from the *Spiritus Mundi*. Lands resting from the Plough or Spade, are much enriched only by the encrease of this *Subject*, and is become an ordinary way of Improvement.

Lands defended from the Violent heat of the Sun, & from the sweeping, cleansing, and exsiccating Air, or winds, grow more Fertile, from the preservation of that Fertile *Subject* from being wasted, which it is apt to be in this Northern Clime where it is but thin, as we evidently see it in all open Champion Lands, when part of the very same Species of Land, being enclosed with tall and defensive Hedges, or Planted with Woods, are much more Fertile than the other: yea, we plainly perceive, that under the Covert of a Bush, Bough or such like, any Vegetable will thrive, and prosper better than on the naked Plain. Where is there more barren, dry, and hungry Land, than on the Plains and Waste Lands? and yet but on the other side of the Hedges Fertile, either by inclosure, or Planted with Woods: an evident and sufficient demonstration of the high Improvements that may be made by Inclosure only. Also Land hath been found to be extraordinary Fertile under Stopes, Logs of Wood, &c. only by the condensation and preservation of that *Universal Subject*, as appears by the flourishing Corn in the most stony Grounds, where it hath been observed that the Stones taken away, Corn hath not proved so well; and Trees having Stones laid on the Ground about the Roots of them have prospered wonderfully from the same cause: As the Learned *Virgil* hinted on the same occasion.

— *Famque repenti*
Qui Saxo super, atq; ingentis pondere teste
Urgerent. —

In the watering of Meadows, you may observe that the superficial gliding watering thereof doth infinitely advance it's fertility, & accelerates it's growth or vegetation; not so much from the fruitfulness of the water, (although that be a very great help, and some waters abound very much with that *Universal Subject*) but by it's condensation and preservation of that *Subject*; as appears by the warmth and early springing of such Meadows, where the water thinly and superficially moves over it, where on the contrary, water standing and submerging such Meadows, and lying and soaking long under the superficies of the Earth, impedes the motion of that *Subject*, and makes the ground more sterile, and backward in it's growth or springing. That this *Spiritus Mundi* hath in it a sensible heat as well as fertility, we may perceive by Springs in great Frosts, when the Pores of the Earth are shut; the Body from whence these Springs flow is warm: on the contrary, when the Pores are open, and this *Spirit* wasted, and transformed into Vegetables, Animals, &c. and exhausted by the heat of the *Sun*, then is the Body internally cold, as we sensibly perceive by the waters in Wells in the Summer-time.

This *Spiritus Mundi*, whereof we treat, is that which in some places perspires more freely than in other, and causes that different verdant colour of the Grass in certain rings or circles, where the Country people fancy the *Faries* dance.

The more the Aqueous humour of part is concocted or exhausted by the heat of the *Sun* in the Summer-time, the thicker & more viscid is this *Subject*; as appears by it's condensation in the *Air* into *Mildews*, which after a more glutinous manner than other Rains or Dews, is by the cool *Air* condensed into a fat and fruitful matter, part thereof resting on the close and glazie leaves of the Oak, and such like Trees, is collected, and with very little Art transformed by the industrious Bee into that noble substance *Honey*; other part thereof falls on the young *Ears* of *Wheat*, and the Buds of springing *Hops*, where suffering a further degree of congelation, impedes their growth, unless a timely shower wash it off: It also by it's heat tinges the straw of Corn and the leaves of some Trees in spots. At that season of the year also it usually coagulates in some places into *Mushrooms*, which are meerly formed and made up of this subject undigested, & perspire forth in such places in great plenty, so that I have seen a *Mushroom* near an Ell in compass of less than two days growth: the Owner in whose Garden it grew, affirmed it to be of one night only. You may also perceive it in a clear and cool morning condensed into small lines like unto Spiders-webs, near the surface of the earth, especially on the lower and richer Lands.

This is that *Viscid* Vapour that being concocted and digested long in the *Air* by the heat of the *Sun*, or otherwise, is condensed at length into that *Sulphurous* and *Saline* Matter; and which by it's combat in the *Air*, occasions those Igneal Flames, and Claps of Thunder, which more frequently happen at such seasons of the year, and in such Climates when and where this more concocted *Vapour* abounds; and less in the colder Climates and Seasons, where it is more aqueous.

This is that inexhaustible Treasure the Country-man is to preserve, much more than the Soils & Dungs, & such like matters washed away with waters into the Sea, which are inconsiderable in comparison of this: for although Land be never so much impoverish'd through over-tilling thereof, yet duly order'd and defended, by this only Subject may it be recruited

recruited and fertilized, as is evident in the poorest Land where Trees are grown, after the removal of them, the Land is much enriched by their shelter. Also the return of the Soil or Dung that is made of the Product of any Land either by Pasturing or Tilling the same, is a principal part of a good Husband; and not to feed Cattle, cut Hay, and sow Corn on some Lands, and spend their Soil and Manure on other; which is a grand neglect, and a main cause of so much barren and unfruitfull Land in England.

Another thing worthy our consideration concerning this *Universal Subject*, is the abating or removing the Impediments of its Fertility, which do as it were suffocate or conceal that fertile or vegetating quality that is in many things; As in Chalk, and several other Stones, Minerals, and Earths, the Acid or sterile Juice doth prevent that Fertility, which otherwise might be raised from it. Therefore do our Husband-men usually burn Stones into Lime, which gradually evaporateth the Acid quality, and coagulateth and fixeth the more Saline and Fertile, which causeth it to yield so plentiful a nourishment unto Vegetables more than before it was burnt into Lime.

For the same cause is the Superficies or Turf of the Earth burnt in many places, which Country-men usually call *denshiring* or *burn-beating*; only they suppose that the Ashes of the Vegetable contained in the Turf occasions the Fertility: But although that doth yield a part, yet it is the heat of the fire evaporating, and consuming the Acidity of the Earth, which makes the Earth it self prepared, to be the more fertile; As you may observe by the very places where those hills of fire were made, that although you take the Ashes wholly away, yet the Earth under those hills being so calcined, yields a greater nourishment to such Vegetables growing thereon, than any other part of the ground where the Ashes themselves are spread.

For the same reason are the Summer-Fallowings advantageous to the Husbandman, not only for the destroying of the weeds, but for the evaporation of the Acid barren Juice, and digesting and fixing the fertile; by which way of Calcination may several *Stones, Minerals, and Earths*, be made fertile, which unprepared are not so: this may also prove of great use for the advancement of the growth of many excellent Plants and Flowers, as I have been credibly informed hath been secretly practised to that purpose.

The last and none of the least considerable means for the reviving and improving this *Subject*, is not only the planting, sowing, and propagating of *Vegetables* in every place, but to plant, sow, or propagate such that delight in the *Soil* or *Place* under your improvement: be the nature of the *Soil* or *Earth* what it will, there is some Plant or other delights in it: from the highest, cold, hot, dry, or barren hill, to the lowest valley, although in the water it self, you will find either Trees, Pulses, Grasses, Grains, or some other *Vegetable* may be found that will thrive in it.

What every Soil will bear, and what refuse.

This Corn, that Vines more kindly doth produce;

Here young Trees best thrive, there Grass freely grows;

Tinolus, odorous Saffron on us bestows. Virgil.

The Earth full plenty yields.

The

The want of the right understanding hereof hath been one of the greatest checks to our English Improvements; there being so great variety of Land in this Kingdom, yea almost in every Parish doth the Land vary, that when we have had any new way or method of Improvement urged, by sowing or propagating any new sort of Grain, Pulse, or Hay, or otherwise, several have attempted it, few only perhaps have hit the mark, or applied it to the right Soil; the rest having lost their labour and cost, meerly through their own ignorance of the true nature and way of ordering of what they undertake, have cast a scandal on the thing it self, to the great discouragement of others, who otherwise might have reaped great advantage by it.

Having thus given you a short Description of the Growth of *Vegetables*, and of that *Universal Subject*, or *Spiritus Mundi*, out of which they are formed, and of the general Causes of *Improvements*, I will now descend to the more particular and practicable Application thereof; And first,

CHAP. II.

Of the great Benefits and Advantages of Enclosing Lands.

Enclosing of Lands, & dividing the same into several Fields, Pastures, &c. is, and hath ever been esteemed a most principal way of Improvement, it ascertaineth every man his just and due Propriety and Interest, and preventeth such infinity of Trespases and Injuries, that Lands in common are subject unto; occasioning so much of Law, Strife, and Contention: It capacitates all sorts of Land whatsoever for some of the Improvements mentioned in the subsequent Discourse, so that a good husband may plant *Timber*, *Fruit*, or other *Trees* in his Hedge-rows, or any other part of his Lands, or may convert the same to *Meadows*, *Pastures*, *Arable*, or *Gardens*, &c. And sow or plant the same with any sorts of species, of Grain, Pulse, or other Tillage whatsoever, without the check or controul of his unthrifty or envious Neighbours.

Enclosure an
Improvement

It is also of its self a very considerable Improvement: And take it, as it is the most general, so it is one of the highest Improvements in *England*, and it seems to have born an equal honour and preheminance, above Lands in Common in other Countries; and to contend for its Antiquity with the Plough it self; else why should Virgil say?

Ante Jovem nulli subigebant arva Coloni;

Nec signare quidem, aut partire limite Campum,

Fas erat,

“Before Jove’s time no Plowman tore the Grounds,

“Inclosed his own, nor limited others bounds;

“All Common was, and of her own accord,

“The Earth full Plenty freely did afford.

For

For when this and other Countreys were Inhabited by its first Proprietors, they generally lived and preserved themselves by the natural Productions of the Earth, and by Hunting; but as they multiplied and grew ambitious, so they contended one party with the other, and divided the Country into Colonies, Lots, or Cantons. And as the Possessors of each Lot or Canton encreased in Number, Wealth, or Policy, so they subdivided their part into several other petty Lots or Cantons, according to their Families. Thus by degrees hath the whole World almost been divided and subdivided; and sometimes again laid open to several Owners. But these parts in general have a long time been settled and ascertained amongst its Proprietors. Yet in particular there are several large Forests, Chaces, Heaths, Downs, Moors, Commons, & other waste Lands, that are not so ascertained as that each Proprietor hath his just and equal interest therein, and if he had, yet can he not improve the same to his best advantage; So that now in this latter and more perfect age that men pretend to most of certainty and equality in that precious Jewel of Property, the greatest encouragement to Ingenuity, any one would think that so much excellent Land as is in this Kingdom uninclosed, open, and waste, should not lie so, but those persons concerned in them, should agree unanimously to appropriate or enclose the same where the Proprietors are by Law capable. And where they are not to implore the assistance of the Legislative Power, to capacitate them to effect so great and profitable a Work.

That our great Downs, Commons, Heaths, and Wastes, now the Badges of Poverty and Idleness, may be converted into Corn and Pasture Fields, Meadows, Gardens, Orchards, and pleasant Groves, the Marks of Ingenuity and Good Husbandry. And that the naked parts of the Counties of *Wilts, Gloucester, Hampshire, Sarry, &c.* may seem like the delightful parts of *Kent, Herefordshire, &c.*

Enclosure with a good tall Hedge-row, preserves the Land warm, and defends and shelters it from the violent and nipping Winds, that generally nip and destroy much of the Corn, Pulse, or whatsoever grows on the open Field or Champion Grounds, and preserves it also from those drying and scorching Winds more frequent in hot and dry Springs, much damaging the Champion Lands: it much preserves that fertility and richness the Land is either naturally Subject unto, or that is by the diligent care and cost of the *Husbandman* added. It furnisheth the Owners thereof with a greater burthen of Corn, Pulse, or whatever is sown thereon: Also where it is laid down for Meadow or Pasture, it yields much more of Grass than the open Field Land; and the Hedges being well planted with Trees, afford shelter and shadow for the Cattel both in Summer and Winter, which else would destroy more with their feet, than they eat with their mouths, and might lose more of their fat or flesh in one hot day, then they gain in three cool days; and affords the industrious *Husbandman* plenty of Provision for the maintenance of Fire-boot, Blough-boot, Cart-boot; and (if carefully planted and preserved) furnishes him with Timber, Mast for his Swine, and Fruits for Syder, as we have in several other parts of this Treatise casually hinted. It is one of the greatest Encouragements to good Husbandry, and a good Remedy against Beggery; for it brings Employment to the poor.

by the continual labour that is bestowed thereon, which is doubly repaid by the fruitful crop it annually yieldeth, and generally maintains treble the number of Inhabitants or more than the Champion, as you may easily perceive if you compare such Counties and Places in *England*, that are for the most part upon Enclosure, with the Champion or Chilterne Counties or Places; And compare also the Difference of their manner and condition of Living, and their Food and Apparel, &c. it must needs convince you that Enclosure is much to be preferred above the Champion, as well for the publique as private advantage. Our Predecessors were very sensible of the difference, as appears by what ingenious old *Tusser* (who took upon him Husbandry in *Edward* the Sixth's days) saith in his *Rhymes* in his Comparison between *Champion Country*, and *Severall*.

25. *T*'one barefoot and ragged doth go,
And ready in *Winter* to sterbe;
When t'other you see do not so,
But hath that is needfull to serbe,
T'one pain in a Cottage doth take,
When t'other trim Bowers do make.

26. *T*'one layeth for Turf and for Sedge,
And hath it with wonderful suit,
When t'other in every hedge
Hath plenty of Fuel and Fruit;
Ehls twenty times worse than these,
Enclosure quickly would ease.

27. *I*n Wood-Land the poor men that have
Scarce fully two Acres of Land,
More merrily live, and do save,
Than t'other with twenty in hand,
Yet pay they as much for the two,
As t'other for twenty must do.

There are several grand inconveniencies that attend the common Field, and open Land, that Enclosures are not subject unto. As that such Fields that are sown with Corn, are subject to be spoiled by Cattle that stray out of the Commons and High-ways that are contiguous to such Lands.

And that the Owners or Tenants of several parts or portions therein, are bound to keep time as well in Sowing as Reaping, or to let his part lie waste, lest his Corn be spoiled.

The Differences also, and the Profits thereof, are plainly to be discerned and proved by the Severalls, or enclosed Parcels of Land that have been formerly taken out of the Field Land or Commons, and how much they excel the other in every respect, though of the same Soil, and only a Hedge between, and what a yearly value they bear above the other.

And also by the great quantities of Lands that have within our memories lain open, and in common, and of little value, yet when enclosed, tilled, and well ordered, have proved excellent good Land, and suddenly repayed the present and greatest expence incident to Enclosure.

Of all which, and many other infinite Pleasures, Contentments, and Advantages, that Enclosure yields, above the Champion and Field-Land, were they but sensible, who so much affect and contend for the Champion, &c. they could never be so brutish to persist in so injurious and unthrifty a method of Husbandry, both to themselves, to their Neighbours, to the Poor, and to the Common-wealth in general.

Yet here we meet with a very grand Objection against Enclosure. That the Poor are likely to be very great sufferers, who now can keep 2 or 3 small Beasts, and have liberty to make as much use of these Waste Lands, as others, that Probably may have five times the interest that such poor have in these Lands. To which may be answered, That there is neither Law nor Reason for the continuation of an evil custom, to the hindrance of a good. And if such Objectors would but rightly examine, and consider, they would soon find, that such Priviledges of the Poor do very much injure them, and the Commonweal in general. For here, by reason, and under colour of a small advantage on a Common, and by spending a great part of their time in seeking and attendance after their Cattel; They neglect those parts of Husbandry and Labour, that otherwise would maintain them well, and educate their Children in these poor Cottages, as attenders on their small Stocks, and their Neighbours greater, for a small allowance; which is the occasion that so many poor Cottagers are near so great Wastes and Commons.

These open and Champion Counties, by reason of the multitude of these Cottagers, are the Producers, Shelterers, and Maintainers of the vast numbers of Vagrants, and Idle Persons, that are spread throughout the greatest part of *England*; And are encouragements to Theft, Pilfering, Lechery, Idleness, and many other Lewd Actions, not so usual in places where every man hath his proper Lands Inclosed, where every Tenant knows where to find his Cattel, and every Labourer knows where to have his days Work.

Besides, this great Improvement meeteth with the greatest difficulties and impediments; amongst which are the several Interests, and diversity of Titles and Claims to almost every Common-Field or waste Land in *England*. And although (by many) the greater part of the Interested Persons are willing to divide and enclose it, yet if but one or more envious or ignorant person concerned oppose the Design, or that some or other of them be not by the Law under a capacity of assuring his Interest to his Neighbour, the whole must unavoidably cease; which hath proved a general Obstruction, and hath been frequently complained of: For the remedy whereof, a Statute to compel the Minor party to submit to the Judgment and Vote of the Major, and equally to capacitate all persons concerned for such an *Enterprise*, would be very welcome to the Country-man, wherein all particular Interests might be sufficiently provided for; as well the Lord of the Soil, as the Tenant, and the Poor.

It is a common thing to have very many great and large High-ways over most of the *Common Fields and Waste Grounds* in *England*, which prove a very great Check to the design of *Enclosure*, and may most easily be reduced, if a Statute may be obtained for that purpose, which was not long since in agitation, though not completed; than which, as was for the Compulsion and Enabling of opposite and uncapacitated persons, and providing for several Interests, as for the Regulating and right Disposition of common and necessary Ways, no Law or Statute

Several Interests
rests an Impediment.

High-ways an
Impediment.

quell
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rate can be of greater or more *publique* Advantage to the Kingdom, in the more vulgar way or method of *Husbandry*.

Trees not
thriving on
Impediments.

There are several Common-fields, Downs, Heaths, and Waste Lands, that should they be enclosed, it would be very difficult, and in some places seem impossible to advance or propagate any Quick-Fences, or considerable quantity of Trees, as before is hinted at, by reason of the great drought such Land is subject unto in the Summer, and destructive cold Winds in the Winter and Spring. To which we reply, that after, or according to the usual manner of Planting, such Trees or Hedge-rows come to little; because the young Cions they remove, are commonly brought from a fertile, warm, or moist Soil, into a cold, barren, or dry; which must needs produce such an inconvenience.

Also they oftentimes plant Trees not naturally agreeing with the Soil they remove them into, or else plant them deep into the barrenest part of the Earth; or at least take little or no care to defend them (when planted) from the external Injuries of Drought, Cold, &c.

Some say
that the
seeds of
trees
are
not
so
easily
rotted
as
the
young
plants
are.

But if any are willing, or intend to raise a Quick fence; or propagate Trees on such open Land subject to such Inconveniences, the only way is to raise a sufficient quantity before-hand in a Nursery for that purpose, of such Trees or Plants that naturally delight in that Land where you intend to plant them, and then to place them in such order (as you will find hereafter described in the Chapter of *Woods*) that the Roots be not below the best Soil; and that they have a sufficient Bank to shelter them on the one side, and an artificial dry Hedge on the other, which may be continued 'till the quick Plants are advanced above common Injuries: Or you may sow the Seeds of such Trees you intend to propagate in Furrows made and filled with a good Earth, and secured from Cattle, either by a double Hedge, or by Ploughing the Land for several years; and not feeding the same with Cattle, till such time as the Trees are grown up, which will soon repay the imaginary loss of the Herbage, or *Grazing*, especially if the young Cions be (the first and second years of their growth) a little shelter'd from the sharp Winds, by shattering a little Straw, Brake, or Hawk lightly over them, which also rot, and prove a good Manure, and qualify the heat and drought of the Summer.

Some say
that the
seeds of
trees
are
not
so
easily
rotted
as
the
young
plants
are.

Dividing
Lands into
small parcels
an Improve-
ment.

And when once you have advanced an indifferent Bank, Hedge, &c. about your new Enclosures, you may much more easily plant and multiply Rows and Walks of Timber, Fruit, and other necessary Trees, the destructive edge of the cold Winds being abated by the Hedges, &c. We frequently have observed on several high and supposed barren Hills and Plains, Woods and Trees flourishing; and in open Fields or Gardens within the shelter of those Woods, Trees and other Plants prove as well as in the lower Vallies; that it is enough to convince any rational person, that by Enclosure only, may most, if not all the Open, Champion, Plain, Waste, and supposed barren Lands in *England*, be highly improved and advanced to an equal degree of Fertility to the Enclosures next adjacent, using the same good Husbandry to the one as to the other; which can never be whilst it is in Common.

It is observed that of most sorts of Land, by how much the smaller the Enclosure or Crofts are, the greater yearly value they bear, and the better burthen of Corn or Grass, and more flourishing Trees they yield; and the larger the Fields or Enclosures are, the more they resemble the Common Fields or Plains, and are most subject to the like inconveniences.

cies. We generally find that a Farm, divided into many Severals, or Enclosures,, yields a greater Rent, than if the same were in but few.

Too many Hedges and Banks in rich or watered Meadows waste much Land, and injure the Grass by their shadow, and by dripping, for that needs no shelter: Grass abides any weather; and in case the cold Spring keeps it back, it fears not draught, but hath water and heat sufficient to bring it forwards, unless you plant such proving *Aquatick* Trees, whose shadows shall exceed in value the Grass they injure, which may well be done in Rows, and on the edges of the Banks, &c. and will amount unto a considerable Improvement, if you select the right kinds.

*Enclosing of
washed Mea-
dows not an
Improvement.*

That Wheat sown in Enclosures, or any Land under the Woods, is subject to *Mildew*, is a general opinion among Husbandmen; and the only great Inconvenience Inclosure is subject unto, Mr. *Harrib* saith, is *Mildew*. But this only an injury to one sort of Grain; Neither is it yet certain that Enclosure is the cause, we find and observe that Wheat in the Field in Country is subject to *Mildew*, though not so frequent as in the Enclosure, the reason that the Land is not so rich generally, nor so moist as Enclosures are, which in Summer time emit a greater quantity of that Moist Spirit, or *Universal Matter of Vegetables* (whereof we discoursed before) than the dry, hungry, open Field-Land doth; which being coagulated in the Air, falls in form of a Dew, sometimes on the Oak, and is then food for Bees; sometimes on Hops and on Wheat, whether high or low, enclosed or open: Nay, sometimes on the one half of a Hop-garden, or a Wheat-field, and not on the other.

*Wheat in En-
closures sub-
ject to Mil-
dew.*

Blasting hath commonly been mistaken for *Mildew*, Wheat being subject also to it in the best and richest Lands in moist years (whereof more in another place) so that we cannot find Enclosures to be the cause of either *Blasting* or *Mildew*, other then that it is the richest and best Land. Also we may observe, that in the Wood-lands, or Countries where most Enclosure is, there the Land yields the greatest burthen of Wheat, as well as other Grain, and more rarely fails than in the Champion Country; wet Summers being not so frequent as dry; the *Vales* and *Enclosures* also being by far the greater support of our English Granary, than the Open, *Champion*, and the *Hills*; which yields us, 'tis true, the greater part of our Drink Corn, delighting in the more hungry Soil, and proves a good Supply in a wet Summer for the other.

But the greatest impediment to this Improvement of *Enclosure*, is the want of People, not only to Till and Manure the Land, but to expend the Product of it. Although that the Mechanick Trades of *England* do more need or require People than Husbandry doth; yet if the Nation were more Populous, and Trade more flourishing, *Agriculture* would be much more in esteem: For then would it's encrease in every respect find a quicker Market, every *Ville* better stored with Inhabitants, as well for Husbandry as Trade.

Then would the Landlord have encouragement to build Houses, and divide his large Farms, when he is sure of Tenants, and can improve the same by encrease of his Rents, and the Tenants would also bestow their labour and skill in Tilling their little Farms, and propagating and encreasing the most necessary Commodities, as well for our present maintenance, as for the use of Tradesmen.

For it is most certain, that a thousand Acres of Land divided with good Quick-fences into 1, 2, or 300 Parcels or Enclosures, is far more profitable

profitable to the Husbandman, than if it were open or in 4 or 5 Parcels, except Meadow only.

And it is as certain, that if a Farm of 1000 Acres be divided into 20 parts, and an House on each part, that it would yield much more Rent than in case it were entire, and it would very well maintain 20 Families, and each Family might find employment in Tilling and Improving the same, were there a Market to take off the Product thereof.

And there would be a Market to take the same off, were the Trading People multiplied in the like proportion; for the more Taylors, Shooemakers, Carpenters, Masons, &c. there are, the more Husbandmen would there be; for Tradesmen must be fed, as well as the other cloathed.

Also if Foreign Trade, or our exportable Manufactures be encouraged or advanced (which cannot well be without an encrease of People) then the Husbandman need not doubt of a Market wherein to vend as well those Productions that are necessary for Trade, as for the Belly. For where most Trade is, there are most People; and where most People are the Husbandman finds the best Market.

But how to employ these People we have already, to keep them from being so great a Charge to the Parishes where they live, and to make them useful Instruments in Trade, and how to multiply people, and encrease the Trade of this Kingdom to the great advantage of every part thereof, requires a particular Treatise on that Subject, this being only to instruct the Husbandman how he may provide Materials for such a Trading People, that they may not make this excuse, That they have not Materials to work on, *But to the Sluggard a Lion is always in the way.*

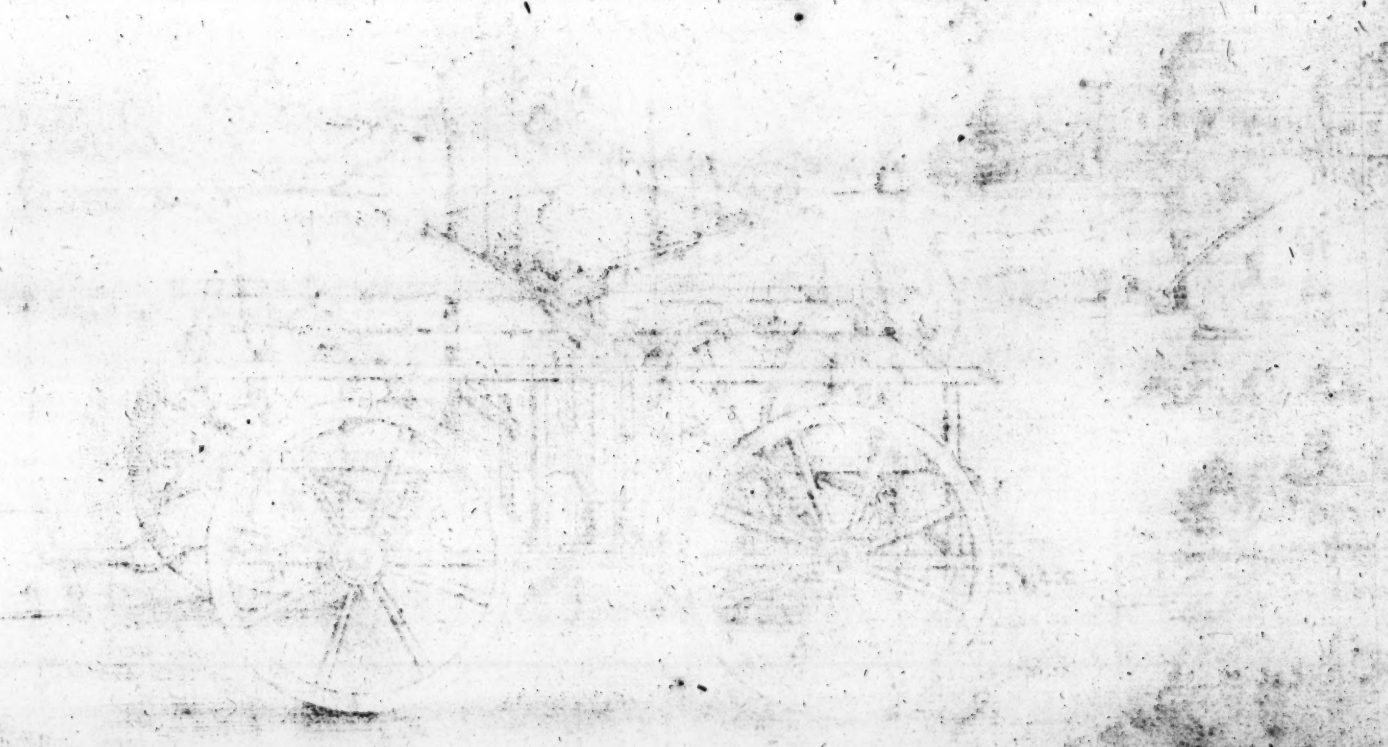
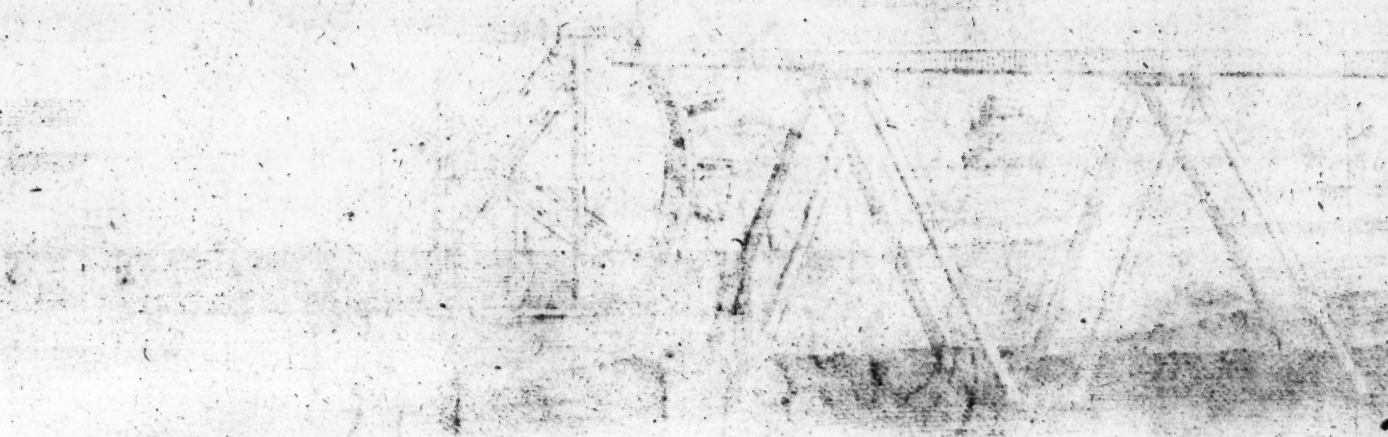
For the greatest impediment to this Improvement of Husbandry, is the want of People, not only to Till and Manure the Land, but to expend the Product of it. Although that the Mechanick Trades of England do more need of People than Husbandry do; yet if the Nation were more populous, and Trade more flourishing, Husbandry would be much more in esteem: for then would it be esteemed in every respect and Market, every where, as it is now, as it is in the more improved, as well for the Husbandman, as for the People.

Then would the Landlord have encouragement to build Houses, and divide his large Farms, when he is sure of Tenants; and can improve the same by encrease of his Rents, and the Tenants would also bestow their labour and skill in Tilling their little Farms, and propagating and encreasing the most necessary Commodities as well for our present main-tenance, as for the use of Tradesmen.

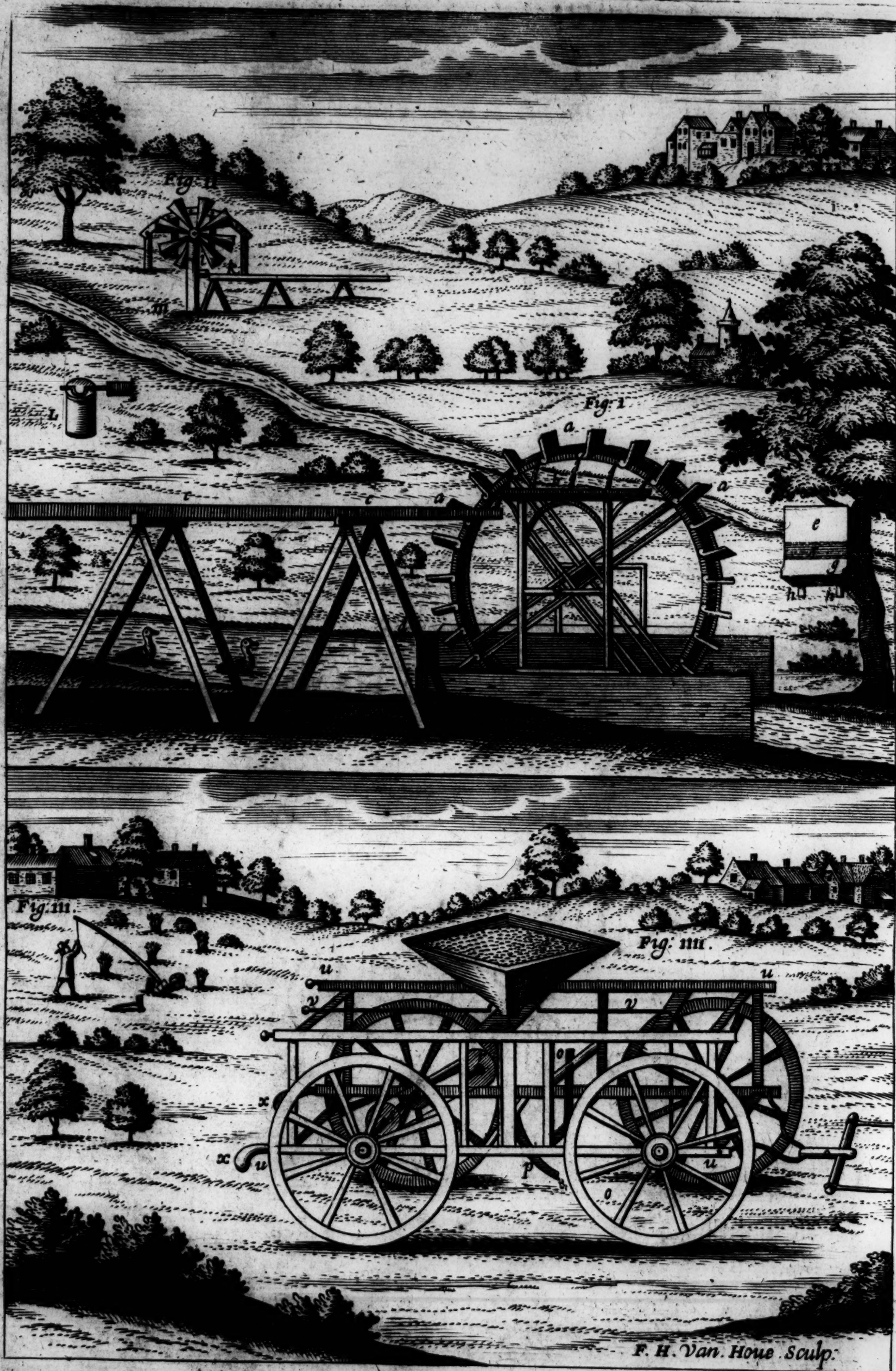
For it is most certain, that a thousand Acres of Land divided with Good Quick Fences into 1, 2, or 300 Parcels or Enclosures, is far more profitable

CHAP.

THE
MOUNTAIN
VIEW
OF
THE
CITY
OF
NEW
YORK
FROM
THE
MOUNTAIN
VIEW
OF
THE
CITY
OF
NEW
YORK



THE
MOUNTAIN
VIEW
OF
THE
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OF
NEW
YORK
FROM
THE
MOUNTAIN
VIEW
OF
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CITY
OF
NEW
YORK



CHAP. III.

Of Meadow and Pasture Lands, and the several ways of their Improvements, either by watering or drowning; or by sowing or propagating several sorts of Grasses or Hays.

Meadow or Pasture Lands are of so considerable use and advantage to the Husbandman, that they are by some preferred above Arable, in respect of the Advantage they bring annually into his Coffers, with so little Toil, Expence and Hazard, far exceeding in value the Corn Lands; and of principal use for the Encrease and Maintenance of his Cattle, his better Food, and the chiefest strength he hath for the Tilling and Improving his other Lands: *Meadow and Pasture Lands* are generally of two sorts *Wet or Dry*; the *Wet Meadows* are such, that the Water overflows or drowns at some times of the year; under which term we shall comprehend all such Meadows, or other Lands that are artificially watered or over-flown, or that are under that capacity of Improvement. The *Dry Meadows or Pastures* are such, that are not over-flown or watered by any River or Stream, under which we shall comprehend all such *Inclosures or Severals* that lie warm and in a fertile Soil, yielding an annual burthen of Hay or Grass, or that are capable of Improvement, by sowing or propagating of new Grasses, Hays, &c. or other ways of Improvement.

S E C T I.

Of the Watering of Meadows.

Of *Wet Meadows* or Land under that capacity of being over-flown or watered, there are two sorts.

First, Such Meadows that lie generally flat on the Banks of great Rivers, and are subject to the over-flowing of such Rivers in times of Land-floods only.

Secondly, Such Meadows that lie near to lesser Rivers or Streams, and are capable of being drowned or watered by diverting such River, or some part thereof out of its natural Current over the same.

Thirdly, Such Meadows or Land that lie above the level of the Water, and yet are capable of Improvement by raising the Water by some artificial ways or means over them.

All which sort of Meadows or Lands under those capacities are very much improved by the Water over-flowing them, as every Country and place can sufficiently evidence and testify.

Humida Majora habet aqua

Virgil.

D

Neither

Neither is there scarcely any Kingdom or Countrey in the World, where this is not esteemed an excellent Improvement. How could *Egypt* subsist, unless *Nilus* did annually Fertilize its Banks by its Inundation? Several other potent and wealthy Countreys there are in those *African* and *Asian* Territories, by the Sediment of the overflowing Waters.

The same was observed by *Virgil* in *Italy* as in his *Georgicks*.

*In a rich Ground with pleasant moisture fed,
Where store of Grass, and verdant Champains be,
Such as in wanton Vales we use to see,
Where Rivers from the lofty Rocks descend
With fruitful Mudd*

The same may be said of many places in *England*, but these are natural; yet are not some Countreys without their Artificial ways of advancing this ponderous Element to a very considerable Improvement, as *Persia*, *Italy*, &c. abound with most ingenious ways for the raising of the Water, as well for their Meadows, as other necessary uses.

Of Meadows
watered by
Floods.

On the Banks and Borders of our great Rivers and Currents, are the most and richest Meadows, consisting generally of a very good fat Soil, as it were composed of the very Sediment of the Water overflowing the same, after great and hasty Rains: such Meadows are capable of very little Improvement, especially those that border on the greater Rivers, as *Thames*, *Severn*, *Trent*, *Ouse*, &c. incapable of obstructions at the pleasure of the Husbandman.

Yet where such Meadows lying on the borders of great Rivers, are of a dry and hungry Soil, and not frequently overflowed by Land-floods, may Artificial Works be made use of for the raising the Water over the same, to a very considerable advantage: whereof more hereafter in this Chapter.

Of Meadows
watered by
diversion of
Rivers, &c.

Other Meadows there are, and those the most general in *England*, that border on the lesser Rivers, Streams, &c. and in many places are overflowed or drowned, by diverting the Water out of its natural and usual Current over them: This Art of diverting Rivers and Streams over dry Lands, is much used through the World; *Rice*, a more universal Grain than Wheat, being propagated for the most part in irrigated Lands. And so long since as *Virgil* Wrote of Husbandry was this in use, as well for Corn in those hotter parts, as here for Grass, as he sings,

*When his scorch'd Fields with dying Herbage burns,
Then may he Conduct from some rising Ground
Water, whose Current makes a murm'ring sound
Amongst polish'd Pebbles, and refreshment yields
From babling Rivulets, to thirsty Fields.*

The same Husbandry is advised by *Rapin* the French Poet, to his Countreymen.

*Let the Meads be drown'd
Let slimy Mudd enrich the Barren Ground,
As it runs deep, with Dams its force restrain;*

This

This is of late become one of the most universal and advantageous Improvements in *England* within these few years, and yet not comparable to what it might be advanced unto, in case these several Obstructions were removed, that impede this most noble and profitable Improvement.

First, The several Interests that are in Lands bordering on Rivers, hinder very much this Improvement, because the Water cannot be brought over several quantities of Land under this Capacity, but through the Lands of ignorant and cross Neighbours, who will not consent thereunto (although for their own advantage also) under unreasonable terms; and some will not at all: others are not by the Law capacitated for such consent (as we noted before concerning Enclosures.)

*Hindrances to
drowning.*

Secondly, That great and pernicious impediment to this Improvement, Mills standing on so many fruitful Streams, prohibiting the Laborious and Ingenious Husbandman to receive the benefit and advantage of such Streams and Rivers, carrying in their Bowels so much Wealth into the Ocean, when the Mills themselves yield not a tenth of the profit to the Owners, that they hinder to their Neighbours, and their Work may as well be performed by the Wind as by the Water; or at least, the Water improved to a better advantage, by facilitating the Motion of the Mill; whereof more hereafter in the Eleventh Chapter.

Thirdly, Another grand Impediment is the Ignorance of the Country-men, who in many places are not capable of apprehending neither the Improvement, nor the cause thereof: But because some certain Neighbours of theirs had their Land overflown a long time, and was little the better, therefore will they not undergo that charge to so little purpose; or because they are commonly possess'd with a foolish opinion, that the Water leaves all it's fatness on the Ground it flows over, and therefore will not advantage the next; which is most untrue; for I have seen Meadows successively drowned with the same Water, to almost an equal Improvement for many miles together. It is true, the Water leaves a great part of it's fatness it hath washed from the Hills and High-ways in the time of great Rains; but we find by daily experience, that Meadows are fertilized by overflowing, as well in frosty, clear, and dry weather, as in rainy, and that to a very considerable Improvement: And also by the most clear and transparent Streams are improved ordinary Lands, that they become most fertile Meadows.

Fourthly, From a greedy and covetous Principle, they suffer the Grass to stand so long on the watered Meadows, that it is much discoloured, and grown so hawmy, and neither so toothsome nor wholsome, as that on unwatered Meadows; which brings an ill name on the Hay; which if cut in time would be much better, and in most watered Meadows, as good as any other: And the *After-Grass*, either to Mow again, or to be fed on the place, will repay the former supposed Loss.

The former Impediments may with much facility be removed by a Law, which would be of very great advantage to the Kingdom in general. The *later* only by the good Examples, and Presidents, of such industrious and worthy Persons that understand better things; the generality of the World, being rather introduced to an ingenious and profitable Enterprise by Example than by Precept; although some are so sordid and self-willed, that neither apparent Demonstration, nor any convincing Argument whatsoever, can divert them from their *Byss* of Ill-Husbandry and Ignorance: whom we leave.

of Meadows
watered by
artificial En-
gines.

Of the Persian
Wheel.

On the Borders or Banks of most Rivers or Streams, lie several pieces of Land that are not capable of being overflowed by the obstruction or diversion of the Water, without a greater injury than the expected advantage would recompence; which may notwithstanding be improved very considerably, by placing of some Artificial Engine in or near such River or Stream, for the overflowing thereof.

The most considerable and universal is the *Persian Wheel*, much used in *Persia*, from whence it hath its name, where they say there are two or three hundred in a River, whereby their Grounds are improved extraordinarily. This *Wheel* is made much after the manner of that of an Under-shot *Mill*, viz. With a double Ring, into which are let two Pins, on which the Floats are fastened; these Floats are made hollow, the half that is most remote from the Wheel, holdeth the Water which is taken in at the open place, above the middle of the back, of the Float; and as the Wheel goeth round, and the Float laden with Water riseth, so the Water by degrees, tendeth toward that part of the Float that is next the Wheel, and as the Float surmounts the Cistern, or Receiver, the Water empties it self into it, every Float succeeding th'one the other, emptying it self into the Receiver; So that if one Float contain a gallon of Water, and there be 30 Floats on the Wheel at one motion round, it delivers 30 gallons of Water into the Cistern: Such a Wheel will be about fifteen Foot Diameter, the Floats at 18 Inches distance, and will deliver the Water at 11 or 12 Foot above the level of your Stream, and will go four times round in one Minute, and carry up about 120 Hogsheads of Water in an hour, with 12 or 18 Inches penning, or stopping of but an ordinary current of Water, which will water very well 30 or 40 Acres of Land; for if your Land be Cold and Clay'y, too much Water doth it hurt, and if it be Light, Warm, or Sandy, a little Water doth it much good. It is also to be observed, that this motion is constant, and will last many years without repair, so that it stand not still, the one side drying and waxing lighter than the other; also observe, that the slower it moves, the better it delivers the Water.

The view of this Wheel you have at the beginning of this Chapter, Fig. 1. *a a a a* signifies the *Wheel*, *b*. that *Cistern* that receives the Water, on the *Trough* standing on *Tressles*, that conveys the Water from the *Cistern* to the place you desire, *d*. the *Hatch*, or *Penstock* that bays up the Water to a reasonable height, under which the Water drives the *Wheel*, *e. e.* one of the Floats presented to your Eye apart from the *Wheel*, *f*. the open place that is to receive the Water, *g*. the open place out of which the Water issues, *h. h.* the two Pins or Ledges, riveted on to the fore side of the *Float*, and wherewith you are to fix the *Float* to the two Rings of the *Wheel*. These or such like *Wheels* are much used in *Spain*, *Italy*, and in *France*, and are esteemed the most facile and advantageous way of raising Water in great quantity to any Altitude within the Diameter of the Wheel, where there is any current of Water to continue its motion; which a small Stream will do, considering the quantity and height of the Water you intend to raise. This way, if ingeniously prosecuted, would prove a very considerable Improvement; for there is very much Land in many places lying near to Rivers, that is of small worth, which if it were watered by so constant a stream as this *Wheel* will yield, would bear a good burthen of Hay, where now it will hardly bear Corn.

How many Acres of Land lie on the declining sides of Hills by the Rivers

Rivers sides, in many places where the Water cannot be brought unto it by any ordinary way? yet by this Wheel placed in the River or Current, and a Trough of Boards set on *Trestles* to convey the Water from it to the next place of near an equal altitude to the Cistern, may the Land be continually watered so far, as is under the level of the Water.

Also there is very much Land lying on the borders of Rivers that is flat and level, yet neither doth the Land flood overflow the same, or at most but seldom; nor can the Water be made by any obstruction thereof, or such like way to overflow it. But by the *Persian Wheel* placed in the River, in the nearest place to the highest part of the Land you intend to overflow, therewith may a very great quantity of Water be raised: For where the Land is but little above the level of the Water, a far greater quantity of Water, and with much more facility may be raised, than where a greater height is required; the Wheel easier made, and with less expence. The best of these Wheels was made by my direction, Anno 1665. at *Wilton* in *Wiltshire*, carrying Water in good quantity above 20 foot high.

Another was made near *Godalming* in *Surrey*, which with good success raises Water for about 6 or 8 Foot, to water several Acres of Meadow.

There are also many large and flat pieces of Land, bordering near unto several Rivers or Streams, that will not admit of any of the aforementioned ways of overflowing or watering; either because the Current cannot easily or conveniently be obstructed, or because such a *Persian Wheel* may not be placed in the Water, without trespassing on the opposite Neighbor, or hindrance to others, or the Water not of force sufficient, or in which places may very well admit of a *Wind-Engine* or *Wind-Mill* erected in such part thereof, where the Winds may most commodiously command it, and where the Land swells above the ordinary level you intend to Water or overflow, though it be remote from the Current or Stream, the Water being easily conducted thereto by an open or subterranean passage from the Stream, such *Wind-Mills* raising a sufficient quantity of Water for a reasonable height for many Acres of Land, must needs prove a very considerable advantage to the Owner, as well for the overflowing thereof, as it hath done to many for the draining large Fens of great quantities of Water to a considerable height: and in raising Water from the Sea at high Water to higher Lands, for the making of Salt: Neither is it altogether necessary that such Land be wholly plain, and open to all Winds; for in Vallies that are on each side defended with Hills, or in such Lands that are on some sides planted with Woods, may such *Wind-Mills* well be placed, where the wind may at some certain seasons perform it's work sufficiently, though not so continually as where the place is free to all winds.

Several have been the Inventions of Ingenious Men to accomplish this Design, and much have they promised to perform; some by the *Horizontal Windmill*, and by a Wheel with Buckets or Scoops fixed unto Chains; Also by a Wheel carrying the Water up in Buckets fixed thereto, and casting the same forcibly from it by the swiftness of it's motion: Others by the perpetual Screw, which you may find mentioned or delineated in Mr. *Blith's English Improver Improved*. But there is none seems to me more feasible, less expensive, of longer continuance, without repair or danger of Winds, nor more effectual to raise much Water with little Wind, than Vertical Sails like the ordinary Wind-Mills, only more in number, and not so long, placed on an *Axis* of a length proportionable to the length

Of Wind-Engines for the raising of Water.

What Wind-mills are best for this Work.

of the *Vanes*; the one end resting on a moveable hollow piece of Timber, that will move round over the Pump, as you have occasion to turn your *Vanes*, as in Fig. 11. at the beginning of this Chapter, at the Letter 2. The other end resting on a Semicircle, in which are several Notches, and Stayes, that you may place it as you please; that be the Wind which way it will, by the motion of that end on the Semicircle, you will have it at the one side of the *Vanes* or the other; Let the Pump over which the one end of the *Axis* rests, be placed in the Pit or Well, out of which you intend to raise the Water; and the Nose or Mouth at such height as you think fit, to convey the Water into a Trough, as at *k*. which Pump may be made of what Diameter you please, according to the strength of your Wind-mil, and height you raise the Water: you may make the Trunk of the Pump round; or if you would have it large, then square may serve as well as round: let the Bucket always dip into the level of the Water, which prevents much trouble and injury to the Work: let the handle of the Pump extend in length to the *Axis* of the Wind-mil, which must be made crooked, to receive and move the same, like unto the *Axis* of a Cutlers Grinding-stone, or Dutch Spinning-wheel turned with the Foot, or the end of the *Axis* of the Windmil, may rest on a Cylinder or Box; made moveable on the top of the Pump it self, with the crooked neck or end within that Cylinder, as at the Figure *s*. So that when you turn it any way, still the end of the *Axis* is perpendicular over the Pump; you may also make a Channel covered or open, to convey the Water out of the River to the Well or Pit wherein the Pump stands, as at *m*: And you must take care that the Handle or Rod of your Bucket be so made that it may Swivel-like, turn any way, as you turn your Wind *Vanes*, without twisting, or otherwise injuring the Bucket, which *Wind-mil* or *Engine*, by any reasonable Gale of Wind, will raise a very great quantity of Water (proportionable to it's strength and height) with ease; being made for a very small charge, considering other costly Engines; is not composed of very many parts, and therefore requires the less repair, and is the less subject to damage by violent Winds; and is easily managed, and therefore the more suitable to our Countrey-men, who usually reject any thing, though never so excellent if it be difficult.

S E C T. II.

*The Principal Rules necessary to be observed in Overflowing
or Drowning of Lands.*

1. In cutting
the main
Carriage.

When you have raised or brought the Water by any of the aforesaid means to the height you expected, then cut your main Carriage, allowing it a convenient Descent to give the Water a fair and plausible Current all along; let the mouth of the main Carriage be of breadth (rather than depth) sufficient to receive the whole Stream you desire, or intend; and when you come to use a part of your Water, let the main Carriage narrow by degrees, and so let it narrow till the end, that the Water may press into the lesser Carriages, that issue all along from the main.

2. In cutting
the lesser
Carriage.

At every rising Ground, or other convenient distances, you ought to cut small tapering Carriages, proportionable to the distance and quantity of Land or Water you have, which are to be as shallow as may be, and

as many in number as you can: for although it seems to waste much Land by cutting so much Turf, yet it proves not so in the end; for the more nimble the Water runs over the Grass, by much the better the Improvement is, which is attained by making many and shallow Carriages.

Another principal Observation in Drowning, or Watering of Lands, is to make *Drains* to carry off the Water the *Carriage* brings on, and therefore must bear some proportion to it, though not so large; and as the lesser Carriages conduct the Water to every part of your Land, so must the lesser Drains be made amongst the Carriages, in the lowest places, to lead the Water off, and must widen as they run, as the Carriages lessen; for if the Water be not well drained, it proves injurious to the Grass, by standing in pools thereon; in the Winter it kills the Grass, and in the Spring or Summer hinders its growth, and breeds Rushes, and bad Weeds; which if well drained off, works a contrary effect.

3. In making the Drains.

Some graze their Lands till *Christmas*, some longer; but as soon as you have fed it bare, then is it best to overflow: from *Albion* tide throughout the Winter may you use this Husbandry, until the Spring that the Grass begin to be large: during *April* and the beginning of *May*, in some places may you give the Grass a little water once a week, and it will prove wonderfully, especially in a dry Spring. In Drowning, observe that you let not the water rest too long on a place, but let it dry in the intervals of times, and it will prove the better; nor let Cattle tread it whilst it is wet.

4. Times for watering or drowning of Land.

In the Summer if you desire to water your Land, let it be in mild or cloudy weather, or in the night time, that the water may be off in the heat of the day, lest it scorch the Grass, and you be frustrate of your expectation.

In many places you may have the opportunity to command a small Spring or Stream where you cannot a larger, or may obtain water by the Engines before mentioned, which may not be sufficient to overflow your Land in that manner; nor so much to your content as the greater Currents may; therefore you must make your Carriages small according to your water, and let there be several stops in them, that you may water the one part at one time, and another part at another: also in such dry and shelving Lands where usually such small Springs are, and water by such artificial ways advanced, a small drilling water, so that it be constant, worketh a wonderful Improvement.

5. Manner of watering of Land by small streams or Engines.

In some places issue Springs whose waters are sterile, and injurious to the Husbandman, as are usually such as flow from *Cole-mines*, or any *Sulphureous* or *Vitrioline Minerals*, being of so harsh and brackish a substance, that they become destructive to Vegetables: Not but that those Minerals; and also those waters contain much of that matter which is the cause, and of the principles of Vegetation, though not duly applied, nor equally proportionated, as much *Urine*, *Salt*, &c. kills Vegetables; yet duly fermented, and artificially applied, nothing more fertile. Such Springs that you suspect, prove them first before you go too far: those that are bad are usually reddish in colour, and leave a red sediment, and shine as it runs, and is not fertile until it hath run far, and increased it self from other Springs, and gained more fertility in its passage: as we usually observe greater Rivers, though reddish in colour, yet make good Meadow.

6. Barren Springs not usefull.

Also

Also some sort of Land will not be improved by watering, as cold, clay'y, strong Land that lies flat; partly by reason that it is cold and moist of it self, and partly because of it's flat situation, that the water is apt to stand on it; for water is not apt to penetrate Clay, nor is clay'y Land apt to yield good Grass by being much watered: therefore such Land is best improved by stirring, laying it in high ridges, and sowing it with Corn or Pulse proper for such Land; light, warm, dry and sandy Land being most improveable by watering of any other Land whatsoever.

S E C T. III.

Of dry Meadow or Pasture.

Every place is almost furnished with dry Meadows, which are convertible sometimes into Meadows, and sometimes into Pastures; and such places much more, where Waters, Springs and Rivulets are scarce, or the Rivers very great, or the Country hilly, that water cannot so well be commanded over such Lands as in other places they may: which dry Meadows and Pastures are capable of Improvement by several ways:

Improved by
Inclosure.

And principally by Enclosure; for where shall we find better dry Meadows, and richer Pastures, then in several hilly places of *Somersetshire*, among the small Enclosures? which not only preserveth the young Grass from the exsiccating Spring-winds, but shadoweth it also in some measure from the Summer-scorching Sun-beams, as before we noted in the Chapter of *Enclosure*. Such Meadows or Pastures well planted with either Timber or Fruit trees in the Hedge-rows, or other convenient places, and enclosed in small parcels, will furnish you with good Hay and good Pasture, when your Neighbour, whose Lands are naked, goes without it; for dry Springs or Summers more usually happen than wet; besides the shadow for your Cattle, and many other advantages, as before we observed.

Burning of
Bushy and
Mossie
ground.

In several places where the ground is moist, cold, clay, spewy, rushy or mossie, or subject to such inconveniencies, that the Pasture or Hay is short, slowre, and not improveable, it is very good Husbandry to pare off the turf about *July* or *August*, and burn the same, (after the manner as hereafter described when we come to treat of burning of Land) and then plough it up immediately, or in the Spring following, and sow the same with Hay-dust, or with Corn and Hay-dust together; for by this means will that acid Juice that lay on the surface of the Earth, which was of a sterile nature, and hindered the growth of the Vegetables, be evaporated away, and also the Grass which had a long time degenerated by standing in so poor a Soil, be totally destroyed, and the Land made fertile, and capable to receive a better species brought in the Seed from other fertile Meadows.

Stubbing up
of Shrubs, &c.

It is too commonly observed that many excellent Meadows, or Pasture-land, are so plentifully stored with Shrubs, small Hillocks, Ant-hills, or such like, that a good part thereof is wholly lost, and so much thereof as is mowed is but in patches here and there, and that that remains not beneficial, as if it were either mowed or fed together. Now the best way or Method of stubbing up such thorny Shrubs, or Broom, or Goss, or any such

such annoying Shrubs, which proves both laborious and costly any other way than this, is ingeniously delivered by *Gabriel Platt*: the Instrument by him discovered is like a three-grained dung-fork only, but much greater and stronger, according to the bigness of the Shrubs, &c. the stile thereof like a large and strong Leaver; which Instrument being set half a foot, or such reasonable distance from the Root of the Shrub, &c. then with a Hedging-beetle drive it in a good depth; then elevate the Stale, and lay some weight or fulcrum under it, and with a Rope fastened to the upper end thereof, pull it down, which will wrench up the whole bush by the Roots. The view of this Instrument you have in Fig. 111. at the beginning of this Chapter. Also Ant-hills prove a very great annoyance to Pasture, and Meadow lands, which may be destroyed by dividing the Turf on the top, and laying it open several ways; then take out the core, and spread over the other Land, and lay the Turf down neatly in its place again, a little hollowing in, and lower than the surface of the Earth; and at the beginning of the Winter the Water standing therein will destroy the remainder of the Ants, and prevent their return, and settle the Turf by the Spring, that by this means may a very great Improvement be made of much Meadow or Pasture land, now a great part thereof Bushes and Ant-hills.

These Meadows and Pasture-lands where the Water overfloweth not at any time, are the only places where you may lay your Dung, or other Menure to the best advantage, it being not capable of being improved by Water, nor the Soil laid thereon subject to be carried away, or at least the better part thereof extracted by the Water, either casually by Floods, or any other way overflowing the same.

The best time for the Soiling of Meadows and Pasture-lands is in the Winter season about *January* or *February*, that the Rains may wash to the Roots of the Grass the fatness of the Soil, before the Sun drieth it away: and dissolve the clots, that may be spread with a Bush drawn over it like a Harrow, before the Grass be too high.

Ashes of Wood, Peat, Turf, Sea-coal, or any other Fewel, is very proper to be laid on Cold, Spewy, Rushey, and Mossie Land, (not sandy or hot) and suits best therewith, and agrees with the Husbandry of burning the Turf, as is before advised: the dung of Pigeons, or any other Fowl, works a better effect on that than other Lands; also all hot and sandy Soils are fittest for that sort of Lands.

Lime, Chalk, Marle, or any cold fossile Soils, are an extraordinary Improvement to dry, sandy, hot Lands of a contrary nature or temperature, as well for Meadow and Pasture, as for Corn-Land: I have seen much of the blew Clay, which they call *Urry*, that's digged out of the Coal mines, and lies near the Coal, laid on Meadow and Pasture-lands, to a very considerable advantage. Many Instances of wonderful Improvements made by mixing of Soils of contrary natures, you may find in several of our modern *Rural Authors*.

Between these two extremes, your ordinary dung or Soil is best bestowed on your Meadows and Pastures, not so much inclining either way; for it is a very principal part of good Husbandry to apply the Soil or Compost properly, as the nature of the ground requireth; whereof you may find more hereafter, in the Chapter of Soils, Dungs, &c.

SECT. IV.

Of several new Species of Hay or Grass.

It is found by daily experience, not only in foreign parts, but in our own Country, that a very great Improvement may be made on the greater part of our Lands, by altering the species of such Vegetables that are naturally produced, totally suppressing the one, and propagating another in its place, which may rejoyce and thrive better there than that before, as we evidently see by Corn sown on Land where hardly Grass would have grown, what a Crop you reap; but these are but Annuals: that which raises the greatest advantage to the Husbandman, is what annually yields an increase without a renovation of expence in Ploughing and Sowing; as we find in the *Clover-grass* or great *Trefoyl*, *St. Foyn* or *Holy-Hay*, *La Lucern*, *Ray-grass*, *Spurrey-seed*, *Trefoyl*, *None such*, &c. For there are many Farms in this Country that have not any Meadow either wet or dry belonging to them, that may by the new Improvement of some of these Seeds or Grasses be able to make Hay enough of their own without fetching it at a dear rate many miles from home, to their great advantage; & many dry Farms are so improved at this time, which hath been the cause of the fail of Meadow-Land in the Southern parts of *England*, where have been the most of these Grasses propagated; and was the occasion of the many endeavours that were used by some Northern Grassiers to obtain a Law to suppress the Improvement in the Southern parts, lest Grass or grazing-Grounds should become as plentiful in these as in the other parts. It was also the cause that there was a plentiful stock of Hay and Grass in that fatal Winter 1673, that it preserved almost all the Cattle in those Countries, or places where these Grasses were most sown; and Hay at no great price, when in the Western and Northern parts of *England*, through the defect of Hay, and scarcity of Pasture, the greatest part of their Cattle perished, and were forced to seek a supply from those parts, whose Markets they used to furnish, and only (as may probably be conjectured) through the defect of this Improvement. But of these Grasses and their Improvements, we shall more particularize.

Of the Clover-Grass.

Clover-grass hath born the name, and is esteemed the most principal of Grasses, both for the great Improvement it brings by its prodigious Burthen, and by the excellency of the Grass or Hay for Food for Cattle, and is much sown and used in *Flanders* and in *Holland*, Presidents to the whole world for good Husbandry.

In *Brabant* they speak of keeping four Cows Winter and Summer on an Acre, some cut and laid up for Fodder, others cut and eaten green: here in *England* they say an Acre hath kept four Coach-horses and more all Summer long; but if it kept but two Cows, it is advantage enough upon such Lands as never kept one. You may mow the first Crop in the midst or end of *May*, and lay that up for Hay; if it grow not too strong, it will be exceeding good and rich, and feed any thing: then reserve the next for seed, which may yield four Bushels upon an Acre, each Bushel being worth three or four pounds a Bushel, which will amount to the reputed value of ten or twelve pounds per Acre; and after that Crop also it may be fed. It hath also this Property, that after the growing of the

Clover-

Clover grass three or four years, it will so frame the Earth, that it will be very fit for Corn again, which will prove a very great Advantage, and then again for *Clover*. Thus far Mr. *Blin*. Others say it will last five years, and then also yield three or four years together rich Crops of Wheat, and after that a Crop of Oats.

In the Annotations upon Mr. *Hartlib's Legacie*, we find several Computations of the great Advantage hath been made by sowing *Clover grass*, as that a parcel of Ground, a little above two Acres, the second year, did yield in *May* two Load of Hay worth five pounds: the next Crop for Seed was ripe in *August*, and yielded three very great Loads worth nine pounds that year; the Seed was 300^l which with the Hay was valued at thirty pounds, besides the after Pasture. Another President is, that on four Acres there grew twelve Loads of Hay at twice mowing, and twenty Bushels of Seed; one Load of the Hay mown in *May* being worth two Load of the best of other Hay, and the after-Pasture three times better than any other; the four Acres yielded in one year fourscore pounds. Another, that six Acres of *Clover* did maintain for half a year thirteen Cows, ten Oxen, three Horses, and twenty six Hogs; which was valued at forty pounds, besides the Winter-*Herbage*.

The aforesaid Presidents and Valuations seem prodigious, unless a rich, light Land, warm and dry, be sown therewith, in which it principally delighteth; and then it may probably answer the said Valuations, and must needs be a very high Improvement, although the Ground were good and profitable before. It will also prosper and thrive on any Corn-land, well manured or soiled, and brought into perfect Tillage. Old Land, be it coarse or rich, long untilld, is best for Corn, and best and most certain for *Clover-Grass*; and when you have Corned your Land as much as you intend, then to sow it with *Clover* is the properest season: Land too rich for Corn, cannot be too rich for *Clover*. Poor Lands are not fit for *Clover*, unless burnt or denuded, as we shall hereafter direct; or limed, marled, or otherwise manured, and then it will bring forth good *Clover*.

Clover grass usually decayeth at three years growth: But the reason is, because it is every year mown down for Hay, and hath not time to shed it's Seed for renovation of it's Species. Therefore if you design your Land to lie longer for *Clover*, it's very probable that the letting of it stand to shed it's Seed the third Summer, may cause a new Crop to spring up, and save you the labour of ploughing and sowing it; which if you design, then will it be your best way to put store of Cattle in when the Seed is ripe, and let them feed and tread in the Seed.

An Acre of Ground will take about ten pounds of your *Clover-grass* Seed; which is in measure somewhat about half a peck, according to Sir *Richard Weston*. The quantity of Seed for an Acre Mr. *Blin* conceives will be a Gallon, or nine or ten pounds, which agrees with the other: But if it be husky (which saves labour in cleansing of it, and also sows better by filling the hands, then mixed with any other thing) you must endeavour to find out a true proportion according to the cleanness or foulness you make it: but be sure to sow enough, rather too much than too little; for the more there is, the better it shadows the Ground: Some have sown fifteen pounds on an Acre with good success, ten pounds some judge to be of the least; however let the Seed be new and of the best, which the English is esteemed to be.

Quantity of
Seed for an
Acre.

The time and
manner of
sowing Clo-
ver-grass.

The usual way is thus advised: When you have fitted your Land by Tillage and good Husbandry, then sowe your *Barley* and *Oats*, and Harrow them; then sowe your *Clover-grass* upon the same Land, and cover it over with a small Harrow or Bush, but sowe not the Corn so thick as at other times the Land usually requires. The principal seasons for the sowing thereof are the end of *March*, and throughout *April*. Sir *Richard Weston* adviseth to sowe the *Clover-seed* when the *Oats* begin to come up; also that you may sowe it alone without any other Seed or Grain, and that it will be ready to cut by the first of *June* the first year. It is also observed that *Polish Oats* are the best Corn to be sown with *Clover* about the middle of *April*: two Bushels and a half, or three Bushels to an Acre, which will yield a middle Crop of *Oats* at Harvest, and shadow the *Clover* from the heat of the Sun; which will be a notable Pasture in *September* or *October* following. But the best time wherein to sowe this Seed in case you will sowe it alone, is about *Michaelmas*, it will then be more free from Weeds than if sown in the Spring, and will gain a head, and strength enough to preserve it self against the Winter.

Of cutting it
for Hay and
for Seed.

About the midst or end of *May*, may you cut the first Crop for Hay; which takes up more time and labour to dry it than ordinary Hay, and will go very near together: yet if it grow not too strong, it will be exceeding rich and good, and feed any thing. The exact time of cutting is when it begins to knot, and then will it yield good Hay, and ere the year be about it may yield you three such Crops; and afterwards feed it with Cattle all the Winter, or until *January*, as you do other Ground: But if you intend to preserve the Seed, then you must expect but two Crops that year; the first Crop as before, but the second must stand till the Seed be come to a full and dead ripeness, for it will not be very apt to shed. When first you can observe the Seed in the Husk, about a month after it may be ripe, and then the Seed begins to change it's colour, and the Stalk begins to die and turn brown; and being turned to a yellowish colour, in a dry time mow it, and preserve it till it be perfectly dry. In some years it ripens sooner than in other, therefore you need not be precise as to the time, but to the ripeness of it. The Stalks or Hawn after you have thrashed out your Seed, Cattle will eat; but if they be too old and hard they will not. Some do elect to boyl them, and make a Mash of them, and it will be very nourishing, either for Hogs, or any thing that will eat thereof. Others reject the Stalks as useless, and esteem the Seed only to be a sufficient Advance of that Crop. If after two years standing of *Clover-grass* you suffer the latter Crop to shed its Seed, you will have your Land new stored with *Clover*, that you need not convert it to other uses.

Sir Richard
Weston.

To witness
of the
or feeding of
Clover-grass.

One Acre of this Grass will feed as many Cows as six Acres of other common Grass, and you will find your Milk much richer, and exceeding in quantity, and fattens very well. The best way of feeding of it, and as is reported, the usual way in *Holland* and *Flanders*, is to cut it daily as your Cattle spend it, and give it them in Racks under some Trees, or in some Shed or Out-house, for the Cattle will injure it much with their feet, it being a gross sort of Vegetable. Unless you mow it for the Seed, the best Husbandry is to graze it, or feed it in Racks; because it is so excellent a Food green, and shrinks so much in the drying. Swine will grow fat with what falls from the Racks. It is not good to let Cattle that are not used to this Food, eat too liberally of

of it at the first; for I knew a Yoke of Oxen put hungry into a field of *Clover-grass*, where they fed so heartily on this sweet Food, that one immediately died through a meer Surfeit, the other with difficulty preserved; therefore some prescribe it to give them a little Straw mixed therewith at the first, or to diet them as to the quantity, may do as well. Swine will pasture on it in the fields.

It being preserved thoroughly dry, about the midst of *March* thrash it, and cleanse it from the Straw as much as you can; then beat the Husk again, being exceeding well dried in the Sun after the first Thrashing, and then get out what Seed you can; or after you have thrashed it, and chaved it with a fine Rake, and sunned it in a hot and dry season, if you will then rub it, you may get very much out of it; some have this way got above two Bushels out of an Acre: Sir *Richard Weston* saith you may have five Bushels out of an Acre.

Of threshing or ordering the Seed.

He is a good Thrasher that can thrash six Gallons in a day, and after the second Thrashing, drying, and winnowing or chaving, it is confidently averred that it may be purely separated from its Husk by a Mill, after the manner as Oatmeal is separated from the Chaff, and that at a very easy rate: But it is also experimented that our own Seed sown in the Husk hath proved the best, thicker, and certainer than that sowed of the pure Seed it self, otherwise you must be forced to mix therewith ashes of Wood or Coals courly sifted, or with Saw-dust, or good Sand, or fine Mould, or any thing else that will help to fill the hand, that you may sowe it evenly and with a full hand. Some have invented new ways of separating the Seed from the Husk.

English proverb.

Of *St. Foyn*.

This *St. Foyn*, or *Holy-hay*, hath in several places of *England* obtained the preference above *Clover-grass*, for that it thrives so well, and is so great an Improvement on our barren Lands, where the other will not; it being also natural to our timorous Rusticks not to hazard Land that will yield them any considerable advantage any other way, on any new method of Husbandry; but if they have a Corner of Land that is of little use to them, they will perhaps bestow a little Seed on it, and but few of that mind neither. Then it continues longer in proof than *Clover-grass*, which wears out in a few years; this continues many, which is a daily provocation to the slothfull to go so near and plain a way, when so long time trodden before his face. In *Wiltshire* in several places there are Presidents of *St. Foyn*, that hath been these twenty years growing on poor Land, and hath so far improved the same, that from a Noble per Acre, twenty Acres together have been constantly worth thirty Shillings per Acre, and yet continues in good proof.

The profits thereof.

If it be sown on the poorest and barrenest Land we have, it will thrive, and raise a very considerable Improvement, except sheer and flight Sands, and all Clays, and other cold and wet Grounds, which are not proper for it, for on rich Land the Weeds destroy; besides, it meliorateth & fertilizeth the Land whereon it hath stood for many years, and not barrenizeth it, as is usual with Annual Seeds. You may break it up, and sowe it with Corn till it be out of heart, and then sowe it with *St. Foyn* as formerly: it will thrive on dry and barren Grounds where hardly any thing else will; the roots being great and deep, are not

On what Land to sow it.

not so soon dried by the parching heat of the Sun, as of other Grasses they are.

Quantity of
Seed on an
Acre, and
manner of
sowing it.

It must be sown in far greater quantity than the *Clover*-seed, because the Seed is much larger and lighter. It may be sown with *Oats* or *Barley*, as the *Clover*: about equal parts with the Grain you sowe it will serve; four Bushels on an Acre is the best proportion. Be sure you make your Ground fine for this and other *French Seeds*, as you usually do for *Barley*. Fear not the sowing of the Seeds too thick; for being thick they sooner stock the Ground, and destroy all other Grasses and Weeds. Some advise to hove these Seeds in, like Pease in Ranges, though not so far distant, the better to destroy the Weeds between it: this will bear this way of Husbandry better than the *Clover*, because that it hath but a small Root, and requires to shadow the Ground more than this. Feed it not the first year, because the sweetness thereof will provoke the Cattle to bite too near the Ground, very much to the injury of your *St Foyne*; but you may mowe it with your *Barley* or *Oats*, or if sown by it self, the first year.

Time of sowing it.

The best time for sowing it is in the *Autumn*, from the beginning of *August* till the end of *September*, without being mixt with other Grain; but if mixt with other Grain, then in the *Spring* from the beginning of *February* till the end of *March*; the earlier it is sown in either season it is the better, and the better to be sown alone than with other Grain.

Use of it.

The Land on which you sowe it ought to be well dressed and harrowed before you sowe it, and then harrow it again.

It is good to keep great Cattle out to the third year, the Roots being till then very tender, especially in moist Grounds; for much treading is very injurious to it.

When it
should be
cut.

If you reserve it for mowing, it must be laid up by the middle of *April* at latest, but better if at the end of *March*. The time of cutting it is when it begins to flower, which is about the middle of *May*, sometimes later: The Hay is most excellent for Horses.

It is best to feed great Cattle on it, especially in the Spring, to prevent the cropping the Budds too near. It feeds Beeves very well, without danger of killing them at their first grazing; which those that feed in *Clover* thorough the negligence or ignorance of the Husbandman are subject unto.

It breeds abundance of Milk in Milch Beasts, and the Butter that is made of it is excellent.

Sheep may be fed on it in the *Autumn*, and part of the Winter, which fatten on it very suddenly.

When ground
it requires.

Of *La Lucerne*.

In the next place this Plant *La Lucerne* is commended for an excellent Fodder, and by some preferred before *St. Foyne*, as being very advantageous to dry and barren Ground. It is managed like the former Seeds; Some write that it requires a moist Ground and rich, others a dry, so that we may conclude it hath proved well on all. The Land must be well dressed, and three times followed.

The

The time for sowing it, is after the cold weather be over, about the middle of *April*; some *Oats* may be sown therewith, but in a small proportion: the Seed is very small; therefore the sixth part of it is allotted to an Acre, as is required of any other Grain, one Bushel thereof going as far as six of Corn: It may be mowen twice a year, and fed all the Winter; the Hay must be well dried and housed, for it is otherwise bad to keep. It is good for all kind of Cattle; but above all, it agreeth best with Horses: it feedeth much more then ordinary Hay, that Lean Beasts are suddenly fat with it; it causeth abundance of Milk in Milch-beasts. It must be given at the first with caution, as before we directed concerning the *Clover*, that is mixed with Straw or Hay. You may also feed all sorts of Cattle with it green all the Summer. It is best to mowe it but once a year: it will last ten or twelve years. If you desire the Seed when it is ripe, cut off the tops in a dewy morning, and put into sheet for fear of losing the Seed; and when they are dry, thrash them thereon, the remaining Stalks may be mowen for Hay. By eating this Grass in the Spring, Horses are purged and made fat in eight or ten days time. One Acre will keep three Horses all the year long. *Harilibs Legacie.*

Ray-grass, by which they improve any cold, sour, clay, weeping Grounds, for which it is best, but good also for dryer upland Grounds, especially stony, light, or sandy Lands, which is unfit for *St. Foy*, hath the precedence of all other Grasses, takes in all sorts of poor Land, endures Summers drought, and is in the Spring the earliest Grass, and cannot at that time be easily overstocked; for it being kept down, becomes the sweeter, and best beloved by Cattle: they sometimes leave it for Meadow-Hay. 'Tis best for Horses being hard Hay, and for Sheep if unsound it has wrought great cures; and in other respects it is the best Winter Grass: Some Sowe two Bushels on a Statute-Acre; but it's better to sowe three mixt with *Nonfuch*, because of it self it's a thin spiry Grass, and will not be of any bulk the first year, unless thickned by the other, which falling by degrees, this Grass thickens upon it, and lasts for ever.

Four Acres thus sown, hath yielded twenty Quarters of Seed, and fourteen Load of Fodder, besides the Spring, and Autumn feeding, whereon six or eight Cattle usually grazed.

S E C T. V.

Of some other Grasses or Hays.

Esparcet is a kind of *St. Foy*, and by some judged to be the same.

La Romain, or French Tares or Vetches, is a Grain annually sown in France, and other Countries, very quick of growth, and Excellent food for Cattle, especially for Horses; and after the feeding of it the former part of the Summer, it may be let grow for Hay. It is not so good as *La Lucern*, because this is annual, the other of long continuance; only this will grow on dryer and poorer Land than *Lucern*, wherein it exceeds it.

In the Low Countries they usually sowe *Spurrey seed* twice in a Summer; the first in May: in June and July it will be in Flower, and in August the Seed is usually ripe.

The

The second time of sowing is after *Rye-Harvest*, which Grounds they usually plough up; and sowe it with *Spurrey-seed*, that it may grow up and serve their Kine (after all late Grasses be eaten up) till *New-years-day*. This Pasture makes excellent Butter, preferred by many before *May-Butter*. Hens will greedily eat the *Herb*, and it makes them lay the more Eggs. *Hartlib's Legacie*.

Trefoyl.

Hop Clover, *Trefoyl*, or *Three-leaved Grass*, is both finer and sweeter than the great *Clover-grass*; it will grow in any ground: it may be sown with *Corn*, (as before) or without, or being sprinkled in Meadows, will exceedingly mend the Hay, both in burthen and goodness.

Long Grass in Wiltshire.

At *Maddington* in *Wiltshire*, about nine miles from *Salisbury*, grows a Grass in a small Plat of Meadow-ground; which Grass in some years grows to a prodigious length, sometimes twenty four foot long; but not in height as is usually reported, but creeping on the ground, or at least touching the ground at several of the knots of the Grass. It is extraordinary sweet, and not so easily propagated as hath been imagined; the length thereof being occasioned by the washing of a declining Sheep-down, that the Rain in a hasty shower brings with it much of the fatness of the Sheep-dung over the Meadow; so that in such *Springs* that are not subject to such showers, or at least from some certain Coasts, this Grass thriveth not so well, the ground being then no better than another.

Saxifrage.

This *Herb* so little esteemed (because not far fetched) is an excellent and proper *Herb* to be nourished or sown in Meadows, for amongst all House-wives it is held for an infallible Rule, that where *Saxifrage* grows, there you shall never have ill Cheese or Butter, especially Cheese; whence it cometh that the *Netherlands* abound much in that Commodity, and only, as is supposed, through the plenty of that Herb.

The *Everlasting Pease* is a Plant easily propagated, and by culture and care thrives exceeding well in good Land; the Root yields a great burthen every year of excellent Provender, which a Horse will eat very well: if therefore an Acre were first tryed to be sown with the seed of this Plant, it is not to be doubted but it would yield a great Improvement. It must be sown early in the year, for the seed is long in coming up: for the first year you can expect nothing but care and pains to preserve it from the Weeds; which if you overcome, every following year will recompence you tenfold, and the longer it grows the better will it be: the way of sowing it is on digged ground, in Rows, and so hawed in the intervals between the Seed.

Or you may first sowe a small Bed of it, and the next year remove it out into ground new dressed with Plow or Spade, and planted at about twelve or eighteen Inches distance, by which means you may easily weed or haw it; it will take root very deep into the earth, and bear a large head, therefore you need not doubt of it's yielding a plentiful Swarth, although at so great a distance.

These and many other most rare and excellent Plants there are, which if they were advanced or propagated that they might openly manifest their worth, might be of much more advantage to the Laborious Husbandmen,

bandmen, than the short, sower, and naturally wild and barren Grass, mixed with a super-abundant proportion of pernicious Weeds: Therefore it would be very acceptable service to the whole Nation, if those that have Land enough, would yearly prove some small proportion of these and other *Vegetables*, not yet brought into common use: by which means they would not only advance their own Estates, but the whole Nation in general, and gain themselves an everlasting Fame and Honour as did the Families of *Piso*, *Fabius*, *Lentulus*, and *Cicero*; by bringing in to use the several Pulses, now called by their Names.

In the greatest esteem, & most worthy of our Care, is the Art of Husbandry, which is the most necessary and useful of all the Sciences, and the one that requires the most Industry and Labour. It is the Plough being the most happy Instrument that ever was discovered, the inventor of the use whereof was by the Heathens celebrated as a God.

Primum Ceres ferre montes crevit aratro.

First Ceres Mounts might to plough the Ground,
When Acorns scarce in Sowed Groves were found.

For before that time it may be supposed Men lived wholly on the Fruits the Earth naturally produced, as in many places lately discovered in Remote parts, the Natives feed most on Fish, natural Productions; with some additional Food they acquire by Hunting, Fishing, or Fowling. But where the severe Winter deprives them of their natural Supplies, Necessity, the Mother of Industry, hath taught the use of the Plough and Spade; and where Men have to maintain that kind have not been sufficient, they have long since learnt to till the Ground, and to turn the Soil from its first situation, and to make their unlimited desires.

The Plough itself, as it is said to have been invented, was always in esteem, as before in the Fables we have shown; and this part thereof, being the most principal, doth it take its Name of Agriculture, from the Tilling of the Land with the Plough, or with the Spade, the more ancient Instrument, though not more necessary and beneficial: And since its first Invention there had been several Improvements made of it, for the more facile and commodious use thereof, and every day almost, and in every place doth the ingenious Husbandman endeavour to excel the Neighbour in this most necessary Art: that from a purchase and profitable Exercise; and it is hoped that by these Improvements and Examples, the more vulgar will be provoked to more universal use of that which is best and most advantageous to themselves, as well as to the Publick. More of this Instrument see hereafter in this Treatise.

SECT. I.

What Lands are improved by the Plough.

Non omnia ferre omnia tellus. Every sort of Land almost requires a different Husbandry; some Grounds producing plenty of that which on another will not grow. This is none of the meanest parts of the Husbandmans Skill, to understand what is most proper to be propagated on

CHAP. IV.

Of Arable Land and Tillage, and of the several Grains, Pulses, &c. usually propagated by the Plough.

IN the greatest esteem, & most worthy of our Care, is the Arable Land yielding unto the laborious Husbandman, the most necessary Sustentation this Life requires, but not without Industry and Toil: The Plough being the most happy Instrument that ever was discovered; the Inventor of the use whereof was by the Heathens celebrated as a Goddess.

Virgil.

*Prima Ceres ferro mortales vertere terram
Instituit*

*First Ceres Mortals taught to plough the Ground,
When Acorns scarce in Sacred Groves were found,
And Dodon Food deny'd; then Swains did toil.*

for before that time it may be supposed Men lived wholly on the Fruits the Earth naturally produced, as in many places lately discovered in Remote parts, the Natives feed most on such natural Productions; with some additional Food they acquire by Hunting, Fishing, or Fowling. But where the severe Winters bereave them of those natural Supplies; Necessity, the Mother of Ingenuity, hath taught the use of the Plough and Spade; and where Men have so multiplied, that those kinds have not been sufficient, they have long since learnt to tear the Ground with Irons, and force from it those things that tend to their preservation, and satisfy their unlimited desires.

Pliny.

The Plough it self, *Triptolemus* is said to have invented. This Art was always in esteem, as before in the Preface we have shown; and from this part thereof, being the most principal, doth it take its Name of *Agriculture*, from the Tilling of the Land with the Plough, or with the Spade, the more ancient Instrument, though not more necessary and beneficial: And since its first Invention there hath been several Improvements made of it, for the more facile and commodious use thereof; and every day almost, and in every place doth the Ingenious Husbandman endeavour to excel the slothfull in this most necessary Art; that from a burthenfome and toilsome labour, it is in some places become but a pleasing and profitable Exercise: and its hoped that by those Presidents and Examples, the more vulgar will be provoked to a more universal use of that which is best and most advantageous to themselves, as well as the Publick. More of this Instrument see hereafter in this Treatise.

SECT. I.

What Lands are improved by Tillage.

Non omnis fert omnia tellus. Every sort of Land almost requires a different Husbandry; some Grounds producing plenty of that which on another will not grow. This is none of the meanest part of the Husbandmans Skill, to understand what is most proper to be Propagated on

on each sort of Land: the strong and stiff Ground receiving the greatest Improvement from the Plough; and the mellow, warm, and light, from other Plantations of Fruits, &c.

*One sort Corn best affects, the other Vines.
To Ceres Thick, to Bacchus Thin inclines.*

Virgil.

Although the best, warmest, and lightest Land yields most excellent Corn, yet the other sorts of Land yield not so good Fruits, Plants, Grasses, Hay, &c. also necessary for the Husbandman: therefore our principal Design must be to appropriate each sort to that method of Husbandry most natural unto it; that where the nature of the Land differs, which it usually doth in the same Parish, and many times in one and the same Farm, and sometimes in the same Field, that there may be used a different way. We have before discoursed of what Lands are fittest for Meadows and Pastures, and now shall give you those Directions I find, to know what is most proper for the Plough.

*Black Grounds, which under heavy Ploughs are rich,
A brittle Soil (for Tillage makes it such)
Is best for Corn: upon no Ground appears
More Wains returning home with weary Steers,
Or where some starchy Swain a Wood destroys,
And Groves, which Peace and Plenty long enjoys;
But a rough Champain soon improves with toil.*

Virgil.

The strong and stiff, as we said before, and also the cold and moist, and that which lies obvious to the extremities of Cold or Heat, as is most of the Champion or Field land; for there may be sown such seeds that naturally affect such Places, until they are reduced and better qualified by Enclosure, the first and main Principle of Improvement: Also mossie and rusty Grounds are much improved by ploughing; and Grounds subject to pernicious Weeds, may be much advantaged by destroying the Weeds, and propagating good Corn or other Tillage in the room thereof.

All Clay, stiff, cold and moist Grounds, are generally thrice ploughed, in the Spring, Summer, and at Seed time for Wheat; and four times for Barley, if it be the first Grain sown after long resting, which in most places is not usual. These several Ploughings or Fallowings are very advantageous to Ground in several respects.

*The manner of
Ploughing or
Husbanding
each sort of Clay,
Stiff, Cold,
and moist.*

1. It layeth the Ground by degrees in Ridges, in such order, as the nature thereof requireth; for the more in number, and the higher the Ridges, the better they are for Wheat, which naturally delighteth in a moist Ground, so that it be laid dry, that is, not subject to be drowned or over-glutted with moist years. And this Method of laying the Ridges, much prevents the blasting of Wheat; for Wheat is easily over-charged with Water, either in Winter or Summer.

2. This often stirring the Land makes it light, and fitter for the Seed to take root therein; the Clods being apt to dissolve by being exposed to the weather, and often broken by the Plough.

Therefore go on,
And thy rich Soyl which the first cheering Sun
Let thy strong Oxen Plow, that Heat may crust
The Mellow Gleab, and turn it into Dust.

Virgil.

It kills the Weeds which in strong Lands are apt to over-run the Corn, and waste the nitrous Fertility of the Earth.

4. It fertilizeth Land: The Sun and the Sull are some Husbandmens Soil.

By capacitating it to receive the nitrous Dews and Celestial Influences, they more easily coagulating and fixing on a light Earth, than on a sad or heavy lump.

The greedy Villager likes best that Mold,
Which twice hath left the Sun, and twice the Cold.

Virgil.

That is to say, often Plowed, and exposed to the Sun and Frost, as some strong Clayes require before they are sown, and then become extraordinary Fertile.

5. It defends the Corn much from the extremities of Weather, especially cold Winds: for the more uneven any Piece of Land is, the better it bears the extremities of the Winter; for which reason in the open Champion where the Land is dry, and they do not lay up their Ridges as in other places, yet they harrow it but little, and leave it as rough as they can, for no other cause but to break the fleeting Winds. The Gardiners near London now seem to imitate this practise, by laying their Gardens in Ridges, not only the better to shelter their Seeds from the cold Winds, but also to give it an advantage of the Sun, as I my self proved it many years since, that Pease sown on the South side of small Beds, so raised, that they seemed to respond the Elevation of the Pole, prospered well, and passed the Winter better, and were much earlier in the Spring, than those otherwise planted.

But in case you intend to sowe Barley first therein, after the third Fallowing, it must lie over the Winter, that the Frosts may the better temper it for the Seed-time, when it is to be ploughed again: If for Pease or Beans, once Fallowing before Winter serves the turn.

If it hath a good Swart or Turf on it, I rather advise you to Denfbire or burn it the Summer before you sowe it; this is the more expeditious and advantageous way, it spends the Acid moisture (an Enemy to Vegetation) it kills the weeds, and brings the Land quickly to a fine light temper.

Rich and mel-
low Land.

Other sort of Land improveable by the Plough, are very good, rich, mixed Land, and of a Black Mold,

Nigra fere & pinguis

Optima frumentis

Virgil.

Or of any other colour that hath lain long for Pasture, till it be overgrown with Moss, Weeds, or such-like, which will as soon grow on rich Lands as poor: To these Lands Ploughing is not only a Medicine or Cure, but raiseth an immediate advantage, and much benefit

fiteth the Land for the future; in case you take but a Crop or two at a time, & lay it down for Pasture again well soiled: or else sown with some of new Grasses or Hays before named; but if not, yet only by soiling it the year before you lay it down, it may yield a very good Grass after the Corn is carried off, and soon come to a Sward. The Land is to be laid in height according as it is inclinable to Moisture or Drought. New broken Ground, if it be sown with Pease the first year, saves one Ploughing, and a good part of the Herbage the Summer before; it also destroys the Weeds, and better prepares the Land for any other Grain.

In every part of *England* there is much waste Land, and other old Pastures that bears the name of barren Land, although for the most part by good Husbandry it may be reduced into Tillage, and become very fruitful and advantageous to the Husbandman in particular, and Commonwealth in general: As is evident in many parcels lately inclosed, and taken out of the supposed barren Heaths and Commons, that are now fruitful Fields: therefore before any thing considerable can be effected to the improvement and right ordering of these sorts of Land, the Design of Enclosure ought to be seriously prosecuted; but for such that are already Enclosed, and yet remain barren and unfruitful, it is a manifest sign of the ill management of the Proprietors, or that the Tenant in possession hath but a short time, or that he is obliged not to alter the nature and order of the Ground; or (which is too common) that the present charge of good Husbandry, exceeds an ill Husbards store: His poor and beggerly Farm hath wasted what he hath, and he has no more to try new Conclusions withal: And in this condition is abundance of Land in this Kingdom: barren Land, poor Cattle, and bad Corn, do insensibly as it were devour us; because once in five or seven years in a very wet Summer, or such like, when the rich Vales suffer, these barren Lands yield a considerable Advantage, which as a Lottery encourages us to beggery.

The best and speediest way to reduce these Lands that have long lain untilld, and that have a Sward, either of sower Grass, or of Rushes, Weeds, or such like, or of heathy Goss, Fern or Broom; by which means they have contracted an evil juyce, injurious to Vegetation, and withal, a fertile Terrestrial Salt: the best way, I say, to improve and reduce these Lands into Tillage, is to Burn-Beat, or Denshire them, as is hereafter shewn; which way is used on the barrenest and poorest Lands in *England* or *Wales*, where before hardly anything would grow, now will grow as good Wheat or other Grain, as on the best Land you have. Many Presidents hereof there are in several places of *England*, where in two or three years, by this only means the Husbandman gains as much above all expence, as the Purchase of the Land was worth before. Observe only this Caution, That you be not too greedy to sow it often till you have drawn out the heart of the Land, which then it will easily yield, that it must lie rested many years to gain a Sward again; Nor that you expend the Soil made of the Straw, on other Lands; which ill Husbandry is generally used, that it brings an ill name on this part of Improvement; which if well soiled and laid for Pasture, after two Crops, will yield a very good Grass, as I have seen experienced, or else may be sown with new Hays or Grasses.

Poor and barren-Land.

S E C T. II.

Of Digging of Land for Corn.

Deep Plough-
ing as good as
Digging.

The *Spade* seems to contend with the *Plough* for Antiquity; and it is the common opinion, that it was in use before it; the *Spade* being the more plain and simple Instrument, and withal the most laborious. The *Plough* seeming to be an *Invention* for expedition, ease and advantage, to which generally all *New Inventions* should tend; but that now at last the *Spade* should supplant the *Plough*, I see no reason; for as the *one* is necessary and useful for the better propagating of Plants that take deep Root, so is the *other* as necessary and profitable for such that root more shallow, as Corn and Pulse usually do: Other differences seem to be in the loosening and tempering the ground for the Seeds, the better to extend and spread their Roots, and for the better burying and destroying the Weeds: These seem to be of greater Importance than the depth only; but all these by a Judicious and Industrious Husbandman are remedied and performed by the *Plough*, as well as by the *Spade*: for if the depth of the Mould will bear it, or the nature of the Seed you sow requires it, a *Double Plough*, the one succeeding the other in depth, may be made; or the Labour may be performed by two *Ploughs*, the one following the other in the same Furrow; but if a *Plough* be Artificially made, and set to work deep, although you plough the less in a day, it will stir the Land deep enough for any of our usual *Grain* or *Pulse*: And as for breaking or tempering the Land, and destroying the Weeds, ploughing and cross ploughing at several Seasons will do more, and at less expence, than once digging can do: And if you please you may draw over the same (before your last ploughing) a large kind of Harrow very heavy, or with a sufficient weight on it, which in some places is usually called *Dragging*. This extremity is only necessary in some sorts of stiff Land, other lighter is much more easily managed. Mr. Platt in his *Adams Tool Reviv'd*; or, *His New Art of Setting Corn*, where he so much contends for the *Spade*, gives this instance of the *Plough*; That a parcel of Land, first cross ploughed with a deep cutting *Plough*, and then Ploughed over the third time with a shallow *Plough*, that made very close and narrow Furrows, then was the Seed sown by a skilful Sower, and then Harrowed over, yielded Fifteen Quarters on each Acre so Tilled and Sown. I presume, if this Relation may upon experience prove true, that none will be so much conceited of a Novelty, as to desert this Method of *Agriculture*, for that tedious and costly way of the *Spade*: But in case it doth not annually amount unto such a prodigious increase as this *President*, yet doth it plainly evidence, that good *Culture* doth infinitely meliorate the Land, and advance the Crop, and manifoldly repay the expence and labour bestowed thereon; which is the most you can expect of the *Spade*.

Plough
trenching.

But if your Land be Light or Mellow, and you are willing to have it turned up deep, then may you Plough one Furrow, and have 5, 6, or 7 Labourers ready with their *Spades*, one at a reasonable distance from the other, to dig in the Furrow, and cast up the Earth on the Glebe turned up by the *Plough*; and whilst your Labourers are about this Work, may your *Plough* plough another Furrow at some reasonable distance;

france, which done, may your Labourers do the like there ; whilst the Plough turning the Sward or upper Earth of another Furrow into the former Trench ; Thus may a Plough go before, and by the help of 3 or 6 Labourers, may a great deal of Land be Plough-trenched in a day, with much more Expedition, than by the same hands it could have been trenched ; and is equally as good, as well for the rooting deep of Beans, Carrots, &c. as for the burying and destroying of the Weeds. This way is much used in *Surry*, and some parts of *Hampshire*. And I doubt not it would more than quit the cost for the sowing of Wheat and other Grain.

S E C T. III.

Of the different Species of Grain, Corn, Pulse, &c. usually sown or necessary to be propagated in our Countrey-Farm.

There is not any Grain in our *European Territories*, more universally *Wheat*. useful and necessary than *Wheat* ; whereof there are several sorts, some more agreeable and better thriving on some sort of Land than on other, that it conduceth much to the Husbandmans advantage, rightly to understand the natural temper of his Land, and what species of Grain, & particular sort of such Grain, best agreeth with the nature of his Land : As some sort of Land bear *Pulses* better than *Corn*, and some bear *Barley* better than *Wheat*, and some sorts of *Wheat* prove better on cold stiff Land, than on hot or dry, &c. We find many sorts of *Wheat*, mentioned in our *Rustick Authors*, as *Whole Straw Wheat*, *Red Straw Wheat*, *Bruet Wheat*, *White and Red* ; *Pollard Wheat*, *White and Red*, *Great and Small* ; *Turkey Wheat*, *Purkey Wheat*, *Gray Wheat*, *Flaxen Wheat* : I suppose the same in some places is called *Lammas Wheat*, *Chiltern*, *Ograve Wheat*, *Sarasins Wheat*, with several other Names, though its probable may be the same sorts. The *Great Pollard*, they say delights best on stiff Lands, and so doth the *Ograve*, *Flaxen Wheat*, and *Lammas*, on indifferent Land, and *Sarasins Wheat* on any. But what the different natures of these and other several sorts are, and in what Land they most principally delight, and the differences of their *Culture*, I leave to the more ingenious and expert Husbandman to find out, and discover.

It is observed that the *Bearded Wheat* suffereth not by *Mildew*, because the Beard thereof is a kind of Defence to preserve it from the Dew. *Wheat* is usually sown in the *Autumn*, and best in a wet season ; *Triticum lato*, *hordeum pulvere conserite* : and either earlier or later, as the nature of the Land, and situation of the place requires.

Barley is another very necessary Grain, though usually converted to the worst use of any that grows in *England* : It is the principal Ingredient in our necessary Drink moderately used, but the use thereof in excess is become the most general raging Vice, and as it were the *Primum Mobile* to most other detestable Evils. It is also a *Bane* to Ingenuity, many of our best *Mechanicks* being too much addicted to the tincture of this Grain ; nevertheless it so naturally delights in our meaner sort of Land, and in the *Champain Countreys*, that its become a principal part of the *Countrimans* Tillage, that the too great a quantity thereof, doth impede the propagation of several other Grains and Pulses, much more necessary. Neither know I any way to remedy this Neglect on the one side, and Wilfulness

Wilfulness on the other, unless the Design of *Enclosure* might take effect, for then would the Lands be so much the more enriched, that they would bear other Grain, to a greater advantage to the *Husbandman* than *Barley*; or that a double or treble Tax might be imposed on every Acre of Barley-land, for what it is on other Grain, which would provoke the Husbandman to that which would be most for his advantage; then would there be a greater plenty of all other sorts of Grain and Pulse, and at a lower price, and only good Liquor a little the dearer, which may by House-keepers the easier be born withal.

The Seasons for sowing of *Barley* differ according to the nature of the Soil, and situation of the Place: Some sowe in *March*, some in *April*, others not until *May*, yet with good success; no certain Rule can be herein prescribed: it usually proves as the succeeding weather happens, only a dry time is most kindly for the Seed.

For as before is observed, moist Weather is best for Winter Grain, and dry for any Seeds in the Spring or Summer, because the Grain in the Winter should spring the sooner; and that sown in the Spring more gradually, lest the too sudden drought injure it. Also a moist Seed time in the Spring, too much favours the Weeds, but in the Winter the Cold prevents them.

Difference of
Barley.

There is little difference observed in *Barley*, only there is one sort called *Rath-ripe Barley*, which is usually ripe two or three weeks before the other, and delights best in some sorts of hot and dry Land.

Rye.

Rye is a Grain generally known, and delighteth in a dry warm Land, and will grow in most sorts of Land, so that the Earth be well tempered and loose; it needeth not so rich a Ground, nor so much care, nor cost bestowed thereon, as doth the Wheat; only it must be sown in a dry time, for Rain soon drowneth it: They usually say a shower of Rain will drown it in the Hopper; Wet is so great an Enemy to it. Therefore dry sandy warm Land, is usually termed *Rye-Land*, being more proper for that, than for any other sort of Grain. It is quick of Growth, soon up after it is sown, and sooner in the Ear, usually in *April*, and also sooner ripe than other Grain; yet in some places it is usual to sowe *Wheat & Rye* mixed, which grow together, and are reaped together; but the *Rye* must needs be ripe before the Wheat: Neither can I discover where a greater advantage lies in sowing them together, than in sowing them apart. The principal Season of sowing of *Rye* is in the *Autumn* about *September*, and after, according as the Season permits, and the nature of the Ground requires.

Oats.

Oats are very profitable and necessary Grain, in most places of *England*: they are the most principal Grain Horses affect, and commended for that use above any other, being of an opening nature, and Sweet; other Grains being apt to stop, which is injurious to labouring or travelling Horses; although on the other hand, Oats newly Housed and Thrashed, before they have sweat in the Mowe, or be otherwise thoroughly dry'd, are too laxative. On such Lands, that by reason of the cold, no other Grain will thrive, yet *Oats* grow there plentifully, as many places in *Wales & Derbyshire* can witness: there is no ground too rich nor too poor, too hot, nor too cold for them: they speed better than other Grain in wet Harvests; the Straw and husks being of so dry a nature, that although they are housed wet, yet will they not heat in the Mowe, nor become mouldy, as other Grain usually do; they are esteemed a peeler of the Ground; the best season for sowing of them,

them is in *February* or *March*. The white Oat is the best and heaviest Grain: The Meal makes good Bread, and much used for that purpose in many places, and also good Pottage, and several other Messes, and is in great request towards *Scotland* and in *Wales*: Oaten Malt also makes good Beer.

There is a new sort of Oats, or Groats growing like unto whole Oats Naked Oats. meal, without any Hulls; they grow near the City of *Durham*, where they have been yearly sown above these thirty years: After they are sown, they come up like common Oats, but with a smaller Blade: when they are ripe upon the ground, they are like ripe Oats, and not easily distinguishable from them; the greatest difference between them, being, that in the thrashing, these come out of the Husk clean like unto *Dantzick Rye*, which they very much resemble both in shape and bigness, and need not to be carried to the Mill, as other Oats, to be made into Oatmeal or Groats.

The taste of them is more sweet and fleshy than Groats made of common Oats; they are most natural boyled, as Rice in Milk.

An Acre doth not yield so many Bushels of these as of the common Oats, by reason the Grain is small and naked, and go near in measure; but what is wanting in measure is supplied in the Value.

The Husbandry used about them is the same as with other Oats.

This I received from an ingenious Hand, and when I hear more I shall impart it.

Buck wheat is a Grain exceeding advantageous on barren sandy Lands, Buck-wheat, or French-wheat. it is much sown in *Surrey*; much less than any other Grain sown an Acre: it is usually sown as *Barley*, but later; it is also late ripe, and yields a very great increase, and is excellent food for Swine, Poultry, &c. after it is mowed it must lie several days 'till the stalks be withered, before it be housed: Neither is there any danger of the seed falling from it. Nor doth it suffer much by wet.

Buck wheat makes as good a Lay for Wheat, as any other Grain or Pulse, especially if it be not mowed, but ploughed in: But the best way is, when it is in Grass before it blossom, to feed it with Milch Beasts, who will tread it down, and make an excellent Lay thereby for Wheat.

Moreover, your Cows will give great store of Milk, it happening at that season when usually other Grass is burnt in hot and dry Summers: So have you a double advantage by your *Buck wheat*.

Our Rustick Authors mention several other sorts of Corn or Grain, as Other sorts of Grain. *Xes* or *Spelt-corn*, *Fat*, *Millet*, *Sesame*, *Rice*, &c. which I shall forbear to particularize on, they being not as yet made Denizens in our Climate; and until we are better satisfied of their natures and use, and experienced in the way or method of their propagation.

Of all Pulses that are sown or propagated, Pease claim the preeminence, Pease. not only for their general use both by Sea and Land, both for man and beast, but also for the diversity of their kinds: almost for every sort of Land, and for every season a different sort of Pease; some are white Pease, some gray, green, &c. not necessary here to be enumerated, every understanding Husband knowing what sorts best accord with his Land. In a stiff fertile Ground they yield a very considerable Crop, without such frequent Fallows as other Grains require, and

destroy the Weeds, and fit and prepare the Land for After crops, being an improver, and not an impoverisher of Land, as Husbandmen usually observe.

Beans.

Beans are of general use and benefit, and placed before any other *Pulses* by *Pliny*, for their commodiousness both for man and beast; yet we find the *Pease* to be more universally propagated. Of *Beans* there are several sorts; the *Great Garden-Beans*, and middle sort of *Bean*, and the small *Bean*, or *Horse-bean*: the latter only is usually sown in *Ploughed Lands*, and delights principally in stiff and strong ground, and thrives not in light, sandy, or barren: They are proper to be sown in Land at the first breaking up, where you intend afterwards to sow other Grain, because they destroy the Weeds, and improve the Land, as generally doth all other *Cod-ware*. Of the other sorts of *Beans*, and also of *Pease*, we shall say more hereafter in this *Treatise*.

Fitches.

The *Citch* or *Fetch*, whereof there are several sorts; but two of most principal Note, the *Winter* and *Summer-Fetch*; the one sown before *Winter*, and abiding the extremity of the *Weather*; the other not so hardy, and sown in the *spring*: They are much sown in some places, and to a very considerable Advantage: They are a good, strong and nourishing food to Cattle, either given in the *Straw* or without, and are propagated after the manner of *Pease*.

Lentils.

The least of all *Pulses* is the *Lentil*, in some places called *Till*: They are sown in ordinary ground, and require it not very rich. Of a very few sown on an Acre, you shall reap an incredible quantity; although they appear on the ground but small, and lie in a little room in the Cart: they are a most excellent sweet Fodder, and to be preferred before any other Fodder or Pulse for Calves, or any other young Cattle; and are the best and cheapest food for Pigeons, especially those that are the most tame, and fed by hand.

Lupines.

Lupines, though not used in this Country as ever I could understand, (unless a few in a Garden) yet we find them highly commended to be a *Pulse* requiring little trouble, and to help the Ground the most of any thing that is sown, and to be a good manure for Barren Land, where it thrives very well, as on sandy, gravelly, and the worst that may be, yet, amongst Bushes and Bryars. Sodden in water they are excellent Food for Oxen, and doubtless for Swine and other Cattle. If this be true, as probably it seems to be, I admire the Plant should be so much neglected; but I may give you a more plenary and satisfactory Account of this, and some other not usual Seeds and Pulses, another time.

Tares.

Tares are not usual in most places of *England*; but where they are sown they as much benefit the Land as other *Pulses*, and are rather to be preferred for Fodder than any other use they can be put unto.

Other Pulses.

There are several other *Pulses* or *Seeds* mentioned in our Authors, as *Fasels*, *Cich Peason*, *Wild Tares*, &c. which if carefully and ingeniously prosecuted might redound to the Husbandmans Advantage; and in the same manner might several other not yet brought into common use, although they might in all probability be as beneficial as those already in use.

SECT.

S E C T. IV.

Of Hemp and Flax.

Within the compass of our Lands subject to the Culture of the Plough, may these two necessary and profitable Vegetables be propagated; requiring a competent proportion of Ground to raise a quantity sufficient to supply our ordinary occasions and necessities; in defect whereof, and meerly thorough our own neglect and sloath, we purchase the greatest share of these *Hempen* and *Flaxen* Commodities we use, from Strangers at a dear Rate, when we have room enough to raise wherewith of the same Commodities to furnish them. But that (to our shame be it spoken) we prefer good Liquor, or at least the Corn that makes it, before any other Grain or Seed, although other may be propagated with greater facility, less hazard, and abundantly more advantageous, both to the Husbandman and Nation in general, than that.

I need not put Excuses into the Country-mens mouths, they have enough for their grand Negligence in this principal part of *Agriculture*; but that I here propose them in hopes some *Worthy Patriots* will use their Endeavours to remove these Impediments. *Impediments to the sowing of Hemp and Flax.*

1. The first and most grand Impediment to this Improvement, is want of Encouragement to Trade, or a right Constitution or Ordering of Employments for the Poor throughout the Countries, which may be accomplished without charge (the common *Remora* to all Ingenuities) by granting some extraordinary *Immunities* to certain Societies in several places convenient in every County to be established; which being the first and chiefest thing to be done, will almost of it self remove all other Impediments. *Want of Trade an Impediment.*

2. The next is the defect of Experience; very few understanding the way of sowing, Gathering, Watering, Heckling, and other particular Modes in ordering these Commodities, nor yet the nature of the Ground either of them delights in: All which by the President and Example of some publique and ingenious Spirits, and by the Constitution of a Trade to take off the said Commodities to the Husbandmans Advantage, may easily be removed. *Want of Experience an Impediment.*

3. Another main Impediment to the Improvement and Propagation of these and several other Staple-Commodities, not yet brought into publique use and practise, is, that the Planter after he hath been at extraordinary Expence in Fertilizing, Tilling, and Planting his Land, and in preserving and advancing the Growth of such Commodities, not only the Profit of his Land, but also of all his Expence and Labour must be *decimated*; which in some years amounts to more than his own clear Profits; when before such Improvements made, little Tythe was paid, as for Pasture-Lands is usual; either a reservation to the *Person* of what was formerly paid out of such unimproved Lands, or a certain *Modus decimandi*, according to the nature of the Commodity planted, might prove a very great Incouragement to the Husbandman, an infinite Advantage to the Nation in general, and not the least injury or loss to the *Clergy* or Impropiator. Some other Impediments there are, and also

other Propositions might be made for the Advancement of this and several other Commodities, but they require more time to treat of, than in this place we may despenſe withal.

Hemp.

Hemp delights in the best Land, warm and sandy, or a little gravelly, so it be rich and of a deep Soil; cold Clay, wet and moorish is not good: It is good to destroy Weeds on any Land. The best Seed is the brightest, that will retain its colour and substance in Rubbing: three Bushels will sow an Acre; the richer the Land, the thicker it must be sown; the poorer, the thinner: from the beginning to the end of April is the time of sowing, according as the Spring falls out earlier or later; it must be carefully preserved from Birds, who will destroy many of the Seeds.

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Value of
Hemp.

to maw
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The Season of Gathering of it is first about *Lammas*, when a good part of it will be ripe, that is the lighter Summer-hemp that bears no Seed, and is called the *Fimble-Hemp*, and the Stalk grows white; and when it is ripe it is most easily discernable, which is about that season to be pulled forth and dried, and laid up for use; you must be cautious of breaking what you leave, lest you spoil it: you must let the other grow till the Seed be ripe, which will be about *Michaelmas*, or before; and this is usually called the *Karle-Hemp*. When you have gathered and bound it up in Bundles, in Bonds of a yard compass, (the Statute Measure) you must stack it up, or house it till you thrash out the Seed. An Acre of *Hemp* may be worth unwrought from five to eight pounds; if wrought up, to ten or twelve pounds or more; and is a very great succour to the poor, the *Hempen Harvest* coming after other Harvests: And then in the bad, wet, and Winter-seasons it affords continual Employment to such also that are not capable of better.

But for the Method and right way of *Watering, Pilling, Breaking, Tenting, &c.* I shall leave you to such that are experienced therein, finding no certain Rules left us by our Rustick Authors.

Flax.

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Flax is also a very excellent Commodity, and the Tilling and Ordering thereof a very good piece of Husbandry; it will thrive in any good sound Land be it in what Country soever, but that is best that hath layen long unploughed: the best Land yields the best *Flax*, and raises the greatest Improvement. The Land must be well ploughed, and laid flat and even, and the Seed sown in a warm season, about the middle or end of *March*, or at farthest in the beginning of *April*. If it should come a wet season, it would require weeding.

an shat
anquiboged

We cannot pretend to an Intemperancy of Climate for neither *Hemp*, nor *Flax*, seeing that in *Scotland, Holland, France, Flanders, &c.* North, East, and South of us, Finer Linnen is made than what we make in *England*; want of Incouragement to Trade and Industry being more wanting here than in those Countries.

Best Seed.

The best Seed is that which comes from the *East Countrey*, although it cost dear, yet it will easily repay the Charge, and will last indifferent well two or three Crops, then it's best to renew it again: Of the best Seed two Bushels may serve on an Acre, but more of our *English Seed*, because it groweth smaller. You must be sure to sow it on good Land, because it robs the ground much, and burneth it, as anciently it was observed by *Vergil, Uris enim lini Campum Seges*, but it liberally repayeth it.

You

You must be careful that it grow not till it be over-ripe, nor to gather it before it be ripe; the ripeness is best known by the Seed; at the time let the Pluckers be nimble, and tie it up in hand-fulls, and set them up until they be perfectly dry, and then house it.

An Acre of good *Flax* on the Ground may be worth, if it be of the best Seed, from seven to twelve pounds, yea far more; but if it be wrought up fit to sell in the Market, it may come to fifteen or twenty pounds. Value of Flax.

As for the Watering, Drying, Breaking, and Tewing, as we said before of *Hemp*, we must refer to those that are better experienced therein.

S E C T V.

Of *Woad*, &c.

This is a very rich Commodity, and worthy to be taken notice of by the *Husbandman*; it requires a very rich Land, sound and warm, saith Mr. *Blish*: But I have seen it usually Planted upon an ordinary Ground, but warm and light, and in good heart, having long rested, and but new broken up: it robs Land much, being long continued upon it; yet moderately used, it prepares Land for *Corn*, abating the over-much Fertility thereof, and draws a different Juice for what the *Corn* requires: the Land must be finely ploughed and harrowed for this Seed, whereof about four Bushels will sow an Acre: it must be finely harrowed, and all Clots, Stones, Turfs, &c. picked away and laid on heaps, as is usual in *Woad-Lands*, then it is to be continually weeded till the Leaves cover the Ground; and when the Leaves are grown fair and large, then set to cutting, and so throughout the Summer, that you may have five or six Crops, and sometimes but three in one year of *Woad*: what grows in Winter, Sheep will eat.

The time for sowing of *Woad* is in the middle and end of *March*.

When it is cut, it must be immediately carried to the Mill. The manner whereof, with the right ordering of *Woad*, and of all other necessary circumstances relating thereto, is best learned of an experienced *Workman*, which is easily obtained.

To take it in the very season is a fundamental Piece, which is when the Leaf is come to its full growth, and retains its perfect colour and lively greenness; then speedily cut it, that it fade not, nor wax pale before you have cut your Crop. To know when it is full ripe.

The two first Crops are the best, which are usually mixed together in the seasoning; the later Crops are much worse, which if either are mixed with the former, they mar the whole.

It is a Staple Commodity for the *Dyers Trade*, and is very advantageous to the *Husbandman*; it more than doubleth the Rent of his Land, sometimes it quadruples it: it hath been sold from 6^d to 30^d the Tun. Profit of Woad.

The Planting and Propagating of *Rape* and *Cole-seed* is esteemed another excellent piece of Husbandry and Improvement for Land, and more especially on *Marsh-Land*, *Fen-Land*, or newly recovered *Sea-lands*, or any Land rank and fat, whether Arable or Pasture. Rape and Cole-seed.

The

The *Cole-seed* is esteemed the best, the biggest and fairest also that you can get: let it be dry and of a clear colour, like the best *Onyon-seed*; it is usually brought from *Holland*.

It is to be sown at or about *Midsummer*: you must have your Land ploughed very well, and laid even and fine, and then sowe it; about a Gallon will sowe an Acre: the Seed must be mixed with some other matter, as before we directed about *Clover-Grass seed*, for the more even dispersing thereof.

When the one half of the Seed begins to look brown, it's time to reap it, which must be done as you usually do *Wheat*, and lay it two or three handfulls together till it be dry, and that through-dry too, which will be near a fortnight ere it be dry enough; it must not be turned nor touched, if it be possible, lest you shed the Seed: it must be gathered on *Sheets*, or large *Sayl-Clothes*, and so carryed into the *Barn* or *Floor* very large, to be immediately thrashed out.

Profit thereof. The main Benefit is in the Seed: If it be good, it will bear five Quarters on an Acre, and is worth usually four Shillings the Bushel, sometimes more and sometimes less; the greater your parcel is, the better price you will have. It is used to make *Oyl* thereof; it thrives best on moist Land, it cannot be too rank; it fits the Land for *Corn*, &c. Thus far hath Mr. *Blith* delivered; little else is written of this Seed, therefore we leave it to the more experienced persons.

Turneps. Although *Turneps* be usually nourisht in Gardens, and be properly Garden plants, yet are they to the very great Advantage of the *Husbandman* sown in his Fields in several foreign places, and also in some parts of *England*, not only for *Culinary* uses, as about *London* and other great Towns and Cities, but also for Food for Cattle, as *Cows*, *Swine*, &c. They delight in a warm, mellow, and light Land, rather sandy than otherwise, not coveting a rich Mould. The ground must be finely ploughed and harrowed, and then the Seed sown, and raked in with a Bush, or such-like. They are sown at two Seasons of the year; in the Spring with other the like *Kitchen-Tillage*, and also about *Midsummer*, or after, in the Fields for the use of Cattle, or any other use. In *Holland* they slice their *Turneps* with their tops, and Rape-seed Cakes, and Grains, &c. and therewith make Mashies for the *Cows*, and give it them warm, which the *Cows* will eat like *Hogs*.

Hartlib's Legacy.

Cows and *Swine* also will eat them raw, if they are introduced into the dyet, by giving the *Turneps* first boyled unto them, and then only scalded, and afterwards they will eat them raw.

It is also reported, that at *Roven* they boyl *Turneps* with the Leaves on them till they be tender, and add thereunto Wheaten-Bran, and of the Cakes of *Rape-Seed* or *Lin Seed*, all which hath a singular faculty of fattening Cattle, (but for Milch-Beasts they put less of the Seeds:) this they give twice a day, and is the most part of their Feeding for the *Winter* only.

It is a very great neglect and deficiency in our English Husbandry, that this particular Piece is no more prosecuted, seeing that the Land it requires, need not be very rich, and that they may be sown as a second Crop also, especially after early Pease; and that it supplies the great want of Fodder that is usual in the *Winter*, not only for fattening Beasts, *Swine*, &c. but also for our *Milch-Kine*.

SECT. VI.

Of Setting of Corn.

Besides the usual manner of sowing of Corn, there are several other ways of dispersing it, as by setting, and hewing of it in, &c. This Art of setting Corn seems to be very ancient, as appears by *Virgil, Unguibus infodiant & ipsis finger* — and hath been a long time attempted to be brought into practice again, as appears by Mr. Platt's *Adams Tool Reviv'd*, Printed in the year 1660. where he doth very ingeniously describe not only the way, but the great advantage that accrues by this then new Discovery: The first part thereof giving you the reason why Corn sown in the common way yields not so great an increase as it doth by being set; then he shews you the manner of digging the Land where you are to set your Corn, (whereof we have spoken before;) then he proceeds to the Description of his Instruments, whereof some are only many Pins set at a convenient distance in a Board, which compressed on the Earth make so many holes wherein the *Wheat-grains* are to be dropt one by one: But because these are very unnecessary and troublesome, and that there are newer and better ways found out, I shall decline any further discourse about them: Also he gives you the distance and depth; where he observes, that at three Inches distance and three Inches depth there are grown thirty Quarters of Wheat on an Acre of Ground: and that four Inches in depth and distance hath yielded but twenty Quarters: he also speaks of five Inches in depth, and five in distance: It's probable the diversity of the Land, or of these years wherein the experiments were proved, might beget some differences. Afterwards he adviseth in barren Lands to fill up the holes with some good mixture or fat compost, or to imbibe the Grain you set therewith; whereof more hereafter,

Then Mr. *Gabriel Platt* succeeds with his newer and better composed Method of setting Corn, whereby he pretends to remedy all the Inconveniences of the former way, by his two new invented Engines, the one for the more expeditious setting of the Corn, the other for the laying up the Land on Ridges, just on the tops of the rows of Corn, that neither surplussage of moisture might annoy it, nor frost in Winter kill it; which way prevents the laying the Land in high Ridges before sowing: Neither need the Land be digged, only ploughed, harrowed, and then set.

The description of which *Engine* for the setting of Corn he gives you in these words: "Let there be two Boards of equal breadth boarded with wide holes at four Inches distance, and be set in a Frame of two Foot high; the one from the other; then let there be a Funnel for every hole made of thin Boards, about two Inches square: Then for the top let there be two thin Boards of equal breadth boarded likewise, whereof the uppermost is to be boarded with an hot Iron, with holes longer the one way than the other, and is to be of such a thickness, that but one Corn only can lie in the hole: The other Board is to be boarded with wide holes, and to be loose, that while the Engine is charged, the holey part may be under the holes of the uppermost Board, and

Discovery of
infinite Treas-
ure.

Description of
Mr. Platts
Engine for
setting Corn.

"when

"when the holes in the Earth are made by the Nether-works, then to
"be moved, so that all the Corns may drop down.

"And for charging, a little Corn being swept up and down by a Broom
"or a Brush, will fill the holes; and if any miss, the workman may put
"in here and there an odd Corn with his fingers, and then moving the
"second Board till the holes be answerable, all the Corns will drop down
"at an instant; then let a large ledge be set about the top of the Engine
"to keep the Corn from spilling; and so is the upper-part thereof made:
"And as for the Nether-work, it is somewhat more chargeable and in-
"tricate; for there must be for every hole a little socket of Brass, cast
"with a Verge to nail unto the Nether-board about the hole, which must
"be turned, and boared all of one wideness to an hairs-breadth, and
"must be wide above, and streight below like a Faucet: Then there
"must be Iron-pins of five Inches long, of great thick Iron-wyer, drawn
"so fit, that no Earth can come into the Brass-sockets. Now to make
"these play up and down at pleasure, is the greatest skill in the whole
"work, and there is no other way but that which is here described.
"There must be for every wooden Funnel a piece of Iron forged flat
"with a hole in the middle, edge-wise, which through two slits in the
"Nether-part, must play up and down, through which a Brass-nail must
"be fastened, cast with an head, contrary to other nails, bowing down-
"wards, to which the Iron-pins must be fastned with wyers, and so thrust
"down and plucked up at pleasure; and then every end of the flat
"pieces of Iron must be fastned into a piece of Wood, of such thick-
"ness, that two thereof may fill up the distance between the rows of the
"wooden Funnels. These may be made to play up and down like Vir-
"ginal-Jacks; and when they are lifted up, then the Brass-Funnels be-
"ing wider above then below, give leave for the Corn to fall into the
"holes all at an instant. These Jacks must be fastned together, the two
"first on either side of the wooden Funnels, then so many together as
"the weight of the workmen is able to thrust down to make the holes:
"And there must be a stay to hold up the Jacks at pleasure when they
"are lifted up again to such an altitude, as that the Corns may descend
"by them into the holes: And the bottom of the Iron-pins must be flat,
"and by that means they will not be so apt to draw up the Earth into
"the Funnels; also the roots of the Corn will spread better, and bring
"a greater increase, if the ground be sadned a little in the bottom of
"every hole: And the tops of the Iron-pins must likewise be flat, and
"hang a little loose in the wyers; else if any of the Brass-sockets get a
"little wrench, they will not be drawn through, because the holes
"must be streight. Though the making this Engine be somewhat
"chargeable and troublesome, yet if Skilfull men first break the Ice,
"then it will be common, and the most profitable Invention that ever
"was found out: and the top of the Engine must be ledged about with
"large ledges to keep the Corn from spilling; so will a Quart or two of
"Corn serve a good while, and must be renewed upon occasion. Also
"if the slits in the Funnels be lined with Iron, the work will be more
"durable.

The second
Engine.

"But lest the charge of this Engine, together with the difficulty of
"getting it, may be a hinderance to the work intended, our Author adds
"a description of a more easie way (*as he supposeth*) for the poorer sort,
"which is subject to the capacity of every ordinary workman, and is
"made

“made of Wood only without either Brass or Iron. But he further tells
 “you, these Engines will not endure like the other; besides, there must
 “be four workmen, because the Engine must be made of two Parts, the
 “one to go before and make the holes, and the other to come after and
 “drop in the Corn, this last must not differ a whit from the upper
 “part of the former, only it must have four feet like tops, in the four
 “corners, which must be set right in the holes, which are by the other
 “part which goeth before, which likewise must have four such feet to
 “leave an impression when it is removed forward, whereby the second
 “may be rightly placed, so that the Corns or Grains may fall right into
 “every hole. That part which must make the holes, is to be made of two
 “boards of equal breadth to the other, and must be bored full of holes,
 “of equal distance likewise; the wooden pins must be greater than those
 “of Iron, because the holes will need to be somewhat large and wide,
 “and they must be fast in the upper board, and loose in the nether board.

“* And if the Engine be large, as this way it may be larger than the
 “other, by reason that it is easilier lifted and removed being in two parts,
 “then the upper must be slit, and divided into so many parts that
 “the weight of the workmen by treading upon them, may press them
 “to make the holes: and though this way will require four Work
 “men, yet the charge will not be double, nor much more than the for-
 “mer way, by reason that the workmen may go forward with more ex-
 “pedition, and may set a broader compass of Ground at one time.

* The reason
 whereof is I
 suppose, that
 the lower
 board should
 be kept down
 while the pins
 be drawn out
 of the Earth,
 that the Earth
 fall not into
 the holes.

Thus far hath Mr. *Gabriel Platt* proceeded in his description of his In-
 struments, which are the most accurate and ingenious that we find pub-
 lish'd. I have given it you *verbatim*, lest any mistake might be imput-
 ed to the *Relater*. To ingenious men it is plain enough, but to others
 this and every thing else besides the plain *Dunstable-road* is intricate: *Ca-
 piam qui carere potest*. Let such make use of it that are willing to pro-
 mote *Ingeniuty*: It's probable it may succeed according to his design, and
 your expectation; if not, by the Errors of these and such-like you may
 discover some better and more facile way to accomplish this Enterprise:
Facile est addere Inventis. Let not a few errors or mistakes, or bad suc-
 cess, discourage any man in a design of so great and publick concernment,
 and experimented at so easie an expence.

But lest any should be over confident in these Engines, and spend much
 time and some cost on their preparation; and not immediately find them
 to respond to his expectation, which might beget a prejudice not only
 against this, but all other ways esteemed Novel (for such that are over-
 earnest to accomplish any design, in case it succeeded not, are sooner pre-
 judiced against it, than those that undertake it with more Caution) I shall
 discover such Inconveniencies and Errors that you may probably meet
 withal in this way Mr. *Platt* describes.

Errors in
 these Engines.

1. Men, not Children nor Women are capable of this Employment,
 that it will be very difficult to procure Setters for any great quantity,
 the work being so tedious, and so many required to perform it: Such
 Inventions being to be preferred, that are most universal, most easy, and
 performed in less time, and with less expence.

2. In hard stiff clay-ground, or any other after Rain, holes will be very
 troublesome to make; the pins going down-right, and rising perpendicu-
 larly again, will bring up much of the Earth with them, that it will be an
 intolerable trouble to keep the pins clean, and the holes open.

3. In stony Land, or where roots of Trees, &c. annoy the ground, this Engine will be useless; for if one straw hinder one pin, the rest cannot enter.

4. The pins must be very thick and near together, else if any of the Corn be injured by Worms, Frost, &c. your Crop will be defective.

*Howing in
of Corn com-
mended.*

All which Inconveniencies and Errors are remedied and prevented by howing in of Corn by hand in rows, both for the saving of Corn, and conveniency of Weeding, and for the better increase at the Harvest, far beyond what can be expected the common way: Also it is of much less expence than the setting Engine.

*Hartlib's
Legacy.*

These several ways are all that we find as yet discovered, and these also, for what I can understand, but little practised, at least for Corn; but for Pease it is usual, especially the better sort of Pease, to be howed in as Mr. Hartlib prescribes, and that to a very considerable advantage: Also I have caused the best sort of Pease to be set as Beans, in a double row at a good distance, with admirable success. The same Method is used at this day about *Godalming in Surrey*.

*The best way
of sowing
Corn.*

But to remedy and remove all manner of Errors or Inconveniencies that can be found in setting or howing of Corn, I shall here give you a plain and perfect description of an easy and feasible Instrument that shall disperse your Corn, Grain or Pulse, of what kind soever, at what distance, and in what proportion you please to design, and that with very great Expedition, and very little extraordinary charge, expence or hazard.

First, make a Frame of Timber, of about two or three Inches square, the breadth of the Frame about two Foot, the height about eighteen Inches, the length about four Foot, more or less as you please; as at u. u. u. u. in Fig. at the beginning of 111 Chapter: place this Frame on two pair of ordinary Wheels like Plough-wheels. The Axle-tree of the two foremost wheels is to lock to either side, as doth the fore Axle-tree of a Waggon, for reasons hereafter shewn; the hindermost Axle-tree being of Iron, and square in the middle, must be fixed to the Centre of the Wheels, that the Axes and Wheels may move together: then about the middle of the Frame in the bottom, let there be fixed an Iron Instrument, or of Wood pointed with Iron, like unto a Coulter, made a little spreading at the bottom, in the nature of a Share, made to pass through two Mortises on the top for its greater strength, and made also to be wedged higher or lower, according as you will have your furrow in depth; as at o. o. the use whereof is only to make the Furrow so that you must make the point thereof of breadth only to move the Earth, and cast it, or force it on either side, that the Corn may fall to the bottom of the Furrow; then over this Share or Coulter, a little behind it may a wooden Pipe be made, to come from the top of the Frame, to the lower end of the Share, tapering downwards as at p. and as near as you can to the Share, to deliver the Corn immediately as the Ground is opened, and before any Earth falls in, that what Earth doth afterwards fall in, it may fall on the Corn. This Pipe is to proceed out of a large Hopper fixed on the top of the Frame, that may contain about a Bushel, more or less, as you think fit, as at q. but that the Corn may gradually descend, according to the quantity you intend to bestow on an Acre; at the very neck of the Hopper, underneath in the square Hollows thereof, must be fitted in the edge of a Wheel of Wood, about half an Inch thick, and

and proportionable to the cavity of the neck; as behind the Letter *r*. the Wheel need not be above two or three Inches Diameter, and fixed on an Axis extending from one side of the Frame to the other; on which Axis is also to be another Wheel with an edge on the circumference thereof like the wheel of a Spit or Jack, as at *r*. which must answer to another wheel of the like nature and form, fixed on the Axis of the hindermost Wheels, as at *s*. then fit a Line (of Silk is best, because it will not be so apt to shrink and reach as Hemp) about these two Wheels, that when the Instrument moves on the hindermost Wheels, by the means of the Line the small Wheel at the neck of the Hopper, may also move; which lesser Wheel in the neck of the Hopper, may have short pieces of thick Leather fixed in the circumference thereof, like unto the teeth of a Jack-wheel, that upon its motion it may deduce the Corn out of the Hopper, in what proportion you please; for in case it comes too fast, then you may by a wedge at the *Tenon* of the piece whereon the Hopper rests, as at *t*. or at the end of the Axis of the lesser Wheel, like as in a *Querne*, force the Wheel and Hopper together; and in case it feeds too slow, then may you remove them by the same Wedges to a further distance: also in case your Line be too slack or too hard, you may prevent either extream by a wedge in the place where the Axis of the Wheels moves, or by a third Wheel, about the middle of the Line made to move further or nearer, as you see cause.

Also by the means of the Iron Rod *v v*. fixed to the foremost Axis that is made to lock; may you guide your Engine at pleasure, which Rod is made crooked at the neck of the Hopper, least that should injure its motion.

And at the turning you may lift up your Engine by the handles at *x*. for whilst you lift it up, the Corn feeds not until you set the same down again.

One Horse and one Man may work with this Instrument, and sow Land as fast or faster than six Horses can Plough, so that you may with ease compute the Expence, in case your Instrument be single; but you may in the same Frame have two shares at twelve Inches distance more or less, as you will have the rows of Corn distant one from the other; and two Pipes out of the same Hopper, and two small Wheels on the same Axis, with other Wheels answerable, every whit as easy to be performed as one, and then may you double your proportion of Land in a day.

This Instrument will always keep the same proportion you first set it to, which you must thus contrive: First, know the length of the Furrow you sowe, then cast up how many of these Furrows at such a distance your Instrument is made for (whether a Foot, more or less) will amount unto an Acre; then conclude how much to sow on an Acre; as suppose a Bushel, then divide that Bushel into so many parts as you have Furrows or distances in that Acre: then take one or two of those parts, and put into your Hopper, and observe whether it will hold out, or superabound at the end of one or two Furrows, and accordingly proceed and rectify the Feeder; or you may judge by your own reason, whether it feed too fast or too slow.

In case it feeds too fast, notwithstanding they be close placed together, you may make that Wheel at the lower Axis, wherein the Line moves, to be less than the upper, then will the motion be slower: and thus may you make it move as slow as you will, by augmenting the

The more particular use and benefit of this Instrument.

1. As to time.

2. Equality of Seed.

3. Rectification of the Feeder.

upper, and diminishing the lower Wheels wherein the Line is, and make it move faster by the contrary Rule.

4. No difference in driving fast or slow. In case you drive apace, it feeds apace; in case you drive but slow, it feeds but slowly: here is no error.

5. No loss of Seed.

When you come to any turning at the Lands end, by lifting up the hindermost part of the Instrument, that those Wheels touch not the ground, the feeding of the Corn immediately ceaseth until you set it down again.

Also all the Corn you sow lies at one certain depth, none too deep, nor any too shallow.

6. Needs no harrowing.

You may place a small kind of Harrow to follow, but the best way is to have on each side each Furrow, a piece of Wood, a little broad at the end, set aslope to force the Earth rounding on the Corn; this may well be placed and fitted to the bottom of this Instrument, just behind the Share and feeding-Pipe.

General advantages of this Instrument.

By this Method of Sowing, any sort of Grain or Pulse may be sowed the one half, and in some places more, which by the other way is either buried so deep under Clots, that it cannot come up, or else is so shallow, that the Cold in the Winter, or Drought in the Summer killeth it, or else lies on the Surface as a prey to the Fowls of the Air: Much also thereof falls in clusters, twenty or thirty Grains where one or two might suffice, which are common Inconveniences, and usually happening to the vulgar way of sowing Corn, the greater half by far is lost, which in all probability may be saved by the use of this very Instrument, which will doubly requite the extraordinary charge and trouble thereof; for here is no Corn sowed under Clots, but in Rows, as the Earth is stirred and moved: it is all at one certain depth, and at one certain distance; and equally covered, below the injury of Frost, and Heat, and Rapine of Birds. Also by this way the Corn may be sown in the very middle or convenient depth of the Mould, that it may have the strength of the Land both below and above the Root, which in the other more usual way, the Corn falls to the bottom of the Furrow on the Gravel, Clay, or such like hard Ground, that it seldom thrives so well as what happens to be in the midst. This way also exceeds the way of Setting Corn, where the Pins thrust into the Ground, hardens and fastens the Mould; that unless the Land be very light, it confines the Roots to too narrow a place, which in this way is prevented, as I have lately observed in Garden-Beans, that those howed in, prove better than those set with a stick.

By the use of this Instrument also may you cover your Grain or Pulse with any rich Compost you shall prepare for that purpose, either with Pigeon-dung dry or granulated, or any other Saline or Lixivial Substance, made dispersible, which may drop after the Corn, and prove an excellent Improvement; for we find experimentally, that Pigeons-dung sown by the hand on Wheat or Barly, mightily advantageth it by the common way of Husbandry; much more then might we expect this way, where the Dung, or such like substance is all in the same Furrow with the Corn, where the other vulgar way, a great part thereof comes not near it.

It may either be done by having another Hopper on the same Frame behind that for the Corn, wherein the Compost may be put, and made to drop successively after the Corn; or it may be sown by another Instrument to follow the former, which is the better way, and may both disperse the Soile, and cover both Soil and Seed.

Of Arable Land and Tillage.

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The *Corn* also thus sown in Ranges, you may with much more convenience go between, and either weed it, or hoe it, and earth it up as you think good, and at Harvest it will easily repay the Charges.

Also the Fore-wheels being made to lock to and fro on either side, you may have an upright Iron pin fixed to the middle of the Axis, extended to the top of the Frame; and from thence a small Rod of Iron to come to your hand, with a crooked neck just against the neck of the Hopper; by means of which Iron rod, you may lock or turn the Wheels either way, and guide your Instrument, and rectify it, if it deviate out of its right course.

The Hopper must be broad and shallow, that the Seed press not much harder when it is full, than when it is near empty, lest in sowing not proportionably.

This Instrument, although it may at the first seem mysterious and intricate to the ignorant, yet I am very confident it will answer to every particular of what I have written of it: and any ingenious Wheel-right Joyner, or Carpenter, may easily make the same with very little Instruction, and any ordinary Ploughman may use it.

If your Land be either near the Water, or Clay, or Sand, Rock, Gravel, &c. it is not then convenient to sow the *Corn* within the Land, because it may not have depth for rooting: By this Instrument may you then by placing the *Share* near the top of the Land, only to remove as it were the Clots, &c. drop your Seed in rows, and by certain Pins, or pieces of Wood or Iron, made flat at the end, and a little sloping, set on each side such rows of *Corn* or Grain, the *Earth* may be cast over it and laid in Ridges, above the ordinary level of the Land; which way I have proved to be very advantageous to Beans laid on a shallow Ground, and covered over, &c.

Another excellent advantage of this Instrument.

The way of Plough-trenching Land before mentioned, prepareth it for all these ways of Setting or Sowing of *Corn*, as well as digging of it.

SECT. VII.

Of the General Uses of Corn, Grain, Pulse, and other Seeds propagated by the Plough.

Wheat is the most general Grain used here in England for Bread, although it be not unfit for most of the uses the other Grains are fit for: As for Beer, the best Beer to keep hath usually a proportion of *Wheat* added to the Malt; and the Bran of *Wheat*, a little thereof boiled in our ordinary Beer, maketh it Mantle, or Flower in the Cup when it is poured out; which sheweth with what a rich spirit *Wheat* is endowed, that so much remains in the very Bran. Also Search is made of musty and unwholesome *Wheat*, and of the Bran thereof, than which there are few things whiter.

Use of Wheat.

The principal use of *Barley* is for the making of Beer, being the sweetest and most pleasant Grain for that purpose; it is one of the best Grains for fattening of Swine, especially being either boiled till it be ready to break with no more water than it drinks up; or ground in a Mill, and wet into a Paste, or made into a Mels, either way it produces most excellent sweet Bacon.

Use of Barley.

Rye,

Of Rye.

Rye, its general use is for Bread, either of it self or mixed with Wheat; it makes Bread moist, and gives it a very pleasant taste to most Appetites. I know no other particular use thereof (it being not universally propagated) only it's reported, that it yields great store of *Spirit* or *Aqua-vita*.

Of Oats.

Oats are the only Grain for a Horse, and best agrees with that Beast of any other, and in which the Horse most delighteth; and is a constant food either for Bread, Cakes, or Oatmeal to the Scots, and several Northern places in England, and in some parts of Wales. *Oats* also will make indifferent good Malt, and a little thereof in strong Beer to be kept, is usual. They are a Grain that Poultry also love to feed on, and it makes them lay store of Eggs above what other Grain doth.

Of Pulses.

The common use of Pulses are generally known, as well for Men as Beasts; but there are several that pretend to extract from them excellent Liquors, and distill very good *Spirits* or *Aqua-vita*, without Maulting, as one (in a certain Tract published by Mr. Hartlip) pretends that Rye, Oats, Pease, and the like inferior sort of Grains, handled as Barley until it sprout, needing not for this work to be dried, but beaten and moistened with its own Liquor, and soundly fermented, will yield a monstrous increase. He also affirms, that out of one Bushel of good Pease will come of *Spirit* at the least two Gallons or more, which will be as strong as the strongest Anniseed-water usually sold in London: this he affirms to be of the least. He afterward in the same Tract gives the particular Process, which is thus.

Let Pease be taken and steeped in as much Water as will cover them, till they Swell and Come, and be so ordered as Barley is for Maulting; only with this difference, that for this work if they sprout twice as much as Barley doth in Maulting, 'tis the better. The Pease thus sprouted, if beaten small, which is easily done, they being so tender, put into a Vessel, and stopp'd with a Bung and Rag, as usually, these will ferment; and after two, three, or four Months, if distilled, will really perform what before is promised.

Thus (he also adds) may a *Spirit* or *Aqua-vita* be made out of any green growing thing, Roots, Berries, Seeds, &c. which are not oily.

Also that the *Spirit* which is made out of Grain not dried into Mault, is more pleasant than the other.

It is not unlikely that Grain may afford its tincture, and that excellent Beer or Ale may be made thereof without Maulting: but these things require in another place to be Treated of; and also of the different ways of Fermenting Liquor, which we refer to another time and place.

The uses of
Hemp-seed,
Flax-seed,
Rape and
Cole-seed.

Hempseed is much commended for the feeding of Poultry and other Fowl, so that where plenty thereof may be had, and a good return for Fowl, the use thereof must needs be advantageous, ordered as you shall find hereafter, when we Treat of Poultry.

Flax-seed, or *Lin-seed*, *Rape*, and *Cole-seed*, are generally made use of for the making of Oyl.

Of the preservation of Corn.

The preservation of Corn when it is plenty and good, is of very great advantage to the Husbandman, and the Kingdom in general; for in scarce and dear years, the Husbandman hath little to sell to advance his

his Stock, and the Buyers are usually furnished with musty and bad Corn, from forreign parts, or from such that were ignorant of the ways to preserve it.

Therefore in cheap years it will be very necessary to make use of some of these ways for the storing up your plenty of Corn, against a time of scarcity.

The way of making it up in *Reecks*, or *Reeck stovels*, set on stones, that the Mice may not come at it, is usual and common.

On Reeck-stovels.
Corn laid up with Chaff.

But Corn thrashed and clean winnowed, is apt to be musty, therefore some advise that you lay up your Corn in the Chaff in large Granaries made for that purpose secure from the Mice; and when you use or sell it, then to winnow it.

Also it is advised to mix Beans with Corn, and that it will preserve it from heating and mustiness. It is probable, that if the Beans be well dried on a Kiln, it may succeed, for then will they attract all superfluous moisture unto them, which is the only cause of the injury to the Corn; for in *Egypt* where it is so dry, Corn will keep in open Granaries many years, as in *Pharaoh's* time. The Beans are easily separated afterwards from the Corn.

Corn laid up with Beans.

It is reported, that pieces of Iron, Flints, Pebbles, &c. mixed with Corn, preserves it from heating: which may be true, for it is usual to set a stick an end in Corn, only to give passage for the Air to prevent heating. A large Granary full of square wooden pipes, full of small holes, may keep long from heating, though not so well as the Chaff, Beans, &c.

Iron, Stones, &c. mixed with Corn.

Also some have had two Granaries, the one over the other, and filled the upper, which had a small hole in the bottom, that the Corn by degrees, like Sand in an Hour-glass, hath fallen into the lower; and when it was all in the lower, they remov'd it into the upper, and so kept it in continual motion; which is a good way to preserve it.

A double Granary, one over the other.

The best Granaries are those built of Brick with Quarters of Timber wrought in the inside, whereto to nail Boards, with which you must line it so close to the Brick, that there may be no shelter for vermin. You may make many Stories one above the other, let them be near the one to the other, for the shallower the Corn lyeth, the better, and is the easier turned, which will be very necessary to do sometimes.

The way of preserving Corn in Granaries, may be very advantageous against a dear year; but if you keep it too long there, it may be unprofitable, and is not so practicable here as in the *Low-Countries*.

First, Because *England* it self is as it were a Granary for these *Countries*, when they have scarce any there, but what they buy abroad from hence or elsewhere, and therefore must have Granaries to lay up their Corn in when they buy it.

Secondly, In case they should not buy (when it is cheap) more than they presently use; in dear years they must expend a great part of their wealth abroad for Corn; when in *England*, in case it be sometimes dearer, yet our Wealth goes not farther than to the Farmer, except in times of great scarcity, which do not happen above once in 10. or 12. years.

Thirdly. In times of War they cannot have Corn so certainly Imported, as in times of Peace. So they are compelled to provide against a war day,

as Husbandmen usually term it, when on the other side (let the Seas be never so much troubled) we have our Corn at home.

So that the principal use of a Granary is against a very dear year; Therefore it is most adviseable to dispose of your Corn in the Granary every other year, and lay up a new store at a low Market, for by the shrinking of the Wheat, and the oldness of it, you may otherwise suffer more than the gain of a dear year can recompense you.

SECT. VIII.

Of the preparation of the Seed.

Dr. Willis de
Fermenta-
tione.

Exemplum
Seminis
et de
materia

Change of
Seed an Im-
provement.

The greatest part of Vegetables, and more especially those whereof we have before Treated, are propagated of Seed, which included in a very small shell, Skin, or husk, containeth the very Quintessence of the Plant that produceth it, and is as it were, the Life and Spirit of the Vegetable, coagulated into a small compass. *Etenim [Natura] e toto Planta mole nobiliores & maxime activas particulas segregat, easque cum paucillo terra & aqua simul collectas, in Semina velut Planta cujusvis quintas essentias efformat; interim truncus, folia, caules, & reliqua Planta membra, principis activis, pene orbata, valde depauperantur, ac minoris efficacie ac virtutis existunt.* This Seed or Spirit of the Plant being cast into its proper Matrix or Menstruum in its proper time doth attract unto its self its proper nourishment or moisture, which by its own strength or power it doth ferment, and transmute that which was before another thing, now into its own being, substance or nature, and thereby doth disband its self, and increase into the form and matter by Nature designed. A more Philosophick Definition and Dissection of the nature of the Seed and Vegetation, we will leave to the more Learned, and content our selves in our Habitation with so much of the understanding thereof, as shall guide us unto the Discovery and Application of what may be this proper Menstruum wherein each Seed most rejoiceth in, and with most delight attracted; for it is most evident, that every Seed as it differs in nature from another, so it requires a different nourishment. For we perceive that in the same Land one sort of Seed will thrive where another will not, according to the Proverb, *One Mans Meat is anothers Poison*; and that any sort of Grain or Seed will in time extract and diminish such Nutriment that it most delights in. Which is the cause that our Husbandmen do find so great an Advantage and Improvement by changing their Seed, especially from that Land which is so often tilled, which they call *Hook-Land*, into Land newly broken; and from dry, barren, and hungry Land to rich and fat Land; also from Land inclining to the South, to Land inclining to the North, & *e contra*; all which produce a good Improvement. As Cattle that are taken out of short sourse, and bad Pasture, and put into good sweet Pasture, thrive better than such that are not so exchanged. After the same manner it is with Trees removed out of bad Ground into good; all which are manifest Signs, that there is some particular thing wherein each Seed delights: which if we did but understand, we might properly apply it, and gain Riches and Honour to our selves; but because we are ignorant thereof, and are content so to remain, we will make use of such Soils, Dungs, Composts, and other Preparations and Ways

Ways of Advancemrnt of the Growth of Vegetables, as are already discovered and made use of, and shall here give unto the Reader the several Ways and Methods we shall find disperfed in our *Rustick Authors* for the imbibition of the Seed, which hath been long attempted, and many ways tryed; but most of them have fallen short of the expectation of the Experimenters, because they neither took the right Matter, nor observed the right manner of the Operation. As according to some Authors you are prescribed to steep your *Corn* in Dung-water, or Water wherein Cow-dung hath lain some time, which it's probable may be some, though little advantage to the *Corn*. Steeping of
Corn in
Dung-water.

Then in one of the same Authors are ye commended to an Experiment better than the former: That whereas before you steeped your *Corn* in the *Water* which had sucked out the strength and salt of the *Dung*, you must now mingle your *Dung*, your *Water* and your *Corn* together, and stir them one whole hour at the least; also in the evening stir them again for half an hour or more, let them stand together all night, and the next day at some tap draw away the *Water*, then mingle the *Corn* and *Dung* thoroughly well together, and after sow the *Dung* and *Corn* so mixed in a barren and hungry mould, and you shall have (saith mine Author) as rich a Crop, as if the Ground it self had been duned before; he giveth also a *Probatum est* unto it.

The same Sir *Hugh Platt* gives you a process of steeping *Corn* out of *Johannes Baptista Porta*, which he pretends to cause a wonderful encrease, and at least five for one above the accustomed yield, which is, *To take the Corn out of the middle of the Ear, and bathe it in sweet Oynment made with the fat of old Goats, being mixed with Bacchus and Vulcan, [which our Author interprets to be Goats-dung, the older the better, moistened with Wine, or new Must, or I rather judge Lees of Wine] let their soft and even laid bed be gently warmed: [which he also interprets to be the Digging of the Land; and by warming, its probable he means soyl-ing or watering it with some prepared rich Liquor.]* Adam's Tool
Revived.

Also our Author there advises for the steeping of *Corn* in new *Ale* or *Wort*, its own natural Bathe; but seems to prefer the steeping thereof in the *Water* wherein the *Dung* of *Oxen*, *Kine*, and *Sheep*, and *Pigeons-dung* hath been imbibed, which he prescribes to be about two parts of *Water* to one of *Dung*, and let them stand four or five days, often stirring them together; which *Water* decanted or coarsly filtered is fit for your use, wherein you are to steep your *Corn* till it be glutted therewith; which you may easily discover: but be sure not to overcharge the *Corn* with the *Liquor*.

Thus far we find how the steeping of *Corn* in *Dung-water* hath been used and approved of, and that as may be presumed from the rationality of the thing, and credit of the Author, with some good success; But it is probable it might not always answer the expectation of the Experimenters, or at least not to produce so great an Increase as the Authors promise; neither can those ways be so excellent as these we shall advise you to, being grounded on more rational Principles, and have been proved to be more effectual than the other.

That which containeth in it most of the *Universal Subject* or *Matter* of *Vegetables* (whereof we discoursed at the the beginning of this Treatise) is the fittest for this purpose; of all which, *Nitre* or *Sal terra* is esteemed the best, whereof *Virgil* adviseth to infuse or besprinkle the Seed:

*Semina vidi equidem multos medicare ferentes
Et Nitroprius — profundere —*

Miraculum
Mundi, p 52.

Explicatio
Miraculi
Mundi, 51.

Idem 46.

Continuatio
Miraculi
Mundi, 21.

This also is that Subject Glauber so highly extols, where he says, *Si Agricola semen hoc menstruo humectatum in agrum spargunt, citius maturescit, granis pinguioribus, &c.* If Husbandmen did some their Seed imbibed with this Menstruum, it would sooner be ripe, and bear better Grain, &c. This Subject or Menstruum he labours in several Tracts of his, to prefer above any other matter whatsoever, for all sorts of Vegetables, either by application thereof unto the roots, or by way of irrigation, or by imbibition of the Seed therein, as very highly conducing to Fertility and acceleration of Maturation; but in another Tract of his, being the Explication of the former, he very honestly undeceives all such that judge this Nitre or Subject to be common Nitre or Salt-petre, *Velim autem mentem intelligi meam non accipiendum esse Nitrum commune, hisce minime proficium.* Common Nitre being not fit for that purpose. The Nitre or *Sal terra* intended by these and other Learned Authors as apt for this work, is the fixed Salt extracted out of any Vegetable, Animal, or Mineral thoroughly calcined, as after the burning of Land in the common way of *burn-betting*, that which causeth so great Fertility is as well the fixed salt or *Alkali* that's left in the *Ashes*, as the waste or expence of the sterile acid Spirit which before kept that vegetating Salt from acting. What is it that is fertile in Lime, Ashes, Soap ashes, &c. but this Nitre, or *Sal terra*, this Universal Subject left therein, and most easily separable after Calcination?

Therefore let every Husbandman that expects so large a Product or Reward, take the right matter, such that Glauber cast on his *Asparagus*, which through its fiery nature destroyed the Worms, or banished them wholly from their ancient habitations, and by its vegetating and fructifying nature it made the *Asparagus* thrive more fully and perfectly than before, &c. This Salt is as easy to be procured, as the *Lee* or *Lixivium* wherewith the Women usually scour their Cloths, being extracted out of any *Ashes*, either of Vegetables, Animals, or Minerals. All the difficulty is in the true proportion and strength of this *Lixivium* or *Menstruum*: for Glauber advises in another Tract of his, by no means to add too much thereof to the *Vines*, lest they grow too rank: but in our way of Imbibition of Grain, we need not fear that; only this we must be cautious of, that the great and fiery heat thereof destroyeth not the Corn, for the highest Medicines taken in excess, prove the greatest Poysons: but let not this prove a Discouragement, for it cannot be difficult to prevent this Inconvenience, either by moderating the quality of the *Menstruum*, or the time of Imbibition.

Next in place to this Universal Subject may be used such materials that contain most of the same, as *Urine*, which contains very much of that Volatile or Vegetating Salt, and hath been experimented to have advanced the growth of Corn, and to have accelerated it, as you may observe in the 402. Experiment of the Lord Bacons *Sylva*. Then the Dung of *Sheep*, *Pigeons*, and other *Fowl*, who because they make no *Urine*, have their Dung enriched with a greater quantity of that Subject than other Creatures, whence it is usually extracted by the *Urine*: *Sheep* also drink but little, and feed dry, which makes their Dung exceeding rich and fertile

fertile. I casually met with the following *Process* highly applauded by the Owners thereof, promising wonderfull Productions from it, which is thus:

Take half a Bushel of Sheeps-dung, and put upon it twenty quarts of Spring-water, set it on the fire till it be luke-warm, but not boyling, and so rub with your hand all the Sheeps-dung by little and little, (till it be dissolved in the water) then let it stand twelve hours, after which strain the water through a course Cloth, with a hard Compression; this water keep for use: Then take of Bay-salt and dissolve it in luke warm water, which water filter, and evaporate in an Earthen Vessel over the Fire; of this congealed Salt after the waters Evaporation, take two good handfuls, likewise do the same with Salt-petre, dissolve it in water, filter the water, and evaporate it; then take of the remaining congealed Salt-petre one good handful, and let both these Salts dissolve in the fore-mentioned Liquor of Sheeps-dung, making it again milk-warm: when all the Salts are therein well dissolved, put into that prepared Liquor eight Gallons of Corn, or other Seed, and let it steep therein thirty or thirty six hours; then take it and put it into a Sieve, and drain the water into another Vessel, which water may be used again in like manner: when the water is all drained away, take the Corn or other Seed and dry it in some upper loft exposed to the Air, not to the Sun, and being almost dry, scatter or sowe it in half proportion: N.B. that the Sheeps-dung dregs being dried must be calcined, and the Salt thereof drawn in luke-warm water, which being filtered and evaporated, the remaining Salt thereof is to be dissolved with the other Salts in the Sheeps-dung water.

I have here given you this process *gratis*, which hath been valued and contracted for at a high rate, the owners promising a very great Increase to succeed. The Process appears to be made not by such as are experienced in Rural Affairs, for you will find it difficult to strain your Sheeps-dung-water, dissolved in those proportions; for the Sheeps-dung wholly dissolves, which doth so thicken the Water, and convert it into a mucilage, that all goes where the water goes, if rightly done; and that which is more strange, the Grain will not only imbibe the water so *animated*, but the very substance of the Dung also, if rightly order'd; which is an Argument sufficient of the melioration of the Grain, inasmuch that no dregs or remainder of the Sheeps-dung was lost, save only a few undissolved treddles. As for the Salts, I think little good is to be expected from them, and therefore hold those troublesome preparations of them needless; only the Salt of the Dung must needs be good, because it is that *Vegetative Salt*, or *Universal Subject* whereof we discoursed before, only it is far fetched and dear bought: as good may be had at a far easier rate for this purpose.

Nevertheless common *Sea-salt* hath been much cried up by some for an Improver of the Seed, and an Example produced of a silly Swain, who passing over an Arm of the Sea with his Seed-corn in a Sack, which by mischance at his landing fell into the water, and so his corn being left there till the next low-water, became somewhat brackish, yet (out of necessity) did the man bestow the same Wheat upon his ploughed Grounds, and at the Harvest he reaped a Crop of good Wheat, such as in that year not any of his Neighbours had the like.

*Fewel-bags
of Art and
Nature.*

Doubtless infusion of the Corn or Seed in any of the aforesaid Materials, is some advantage to it; or in the Lees of Wine, Ale, Beer, Perry, Sider, or else in Beef-broth and the Brine of Poudering-tubs, as is by some advised.

Also some affirm that Corn spritted a little, as they use to do for Mault, and then sown, came up speedily, and got the predomination of the Weeds at first, and so kept the same, that there was produced a far greater increase than ordinary; which is a sufficient convincing Argument, that if common water produce so manifest an Improvement, that then a better Liquor may much more.

Because the Corn also will seem troublesome to sow being wet, it is prescribed either to let it dry a day or two on a Floor, or else to sift slackened Lime thereon, which is to be preferred, because it preserves the Corn from Vermine, Smutt, &c.

Hartlib's
Legacy.

I find also another compounded Liquor to have been commended and experimented for the steeping of Grain therein, which is thus: Pour into quick and unslaked Lime, as much water as sufficeth to make it swim four inches above the Lime, and unto ten pounds of the said water poured off, mix one pound of *Aqua Vita*, and in that Liquor steep or soak Wheat or Corn twenty four hours; which being dryed in the Sun, or in the Air, steep again in the said Liquor twenty four hours more; and do it likewise the third time; afterward sow them at great distances the one from the other, about the distance of a foot between each Grain, so one Grain will produce thirty, thirty six, thirty eight, forty two, fifty two Ears, and those very fruitful, with a tall Stalk equalling the stature of a Man in height.

This seems to be a most rational Process for this purpose, and on this and the like ways of Maceration or Fermentation of the Seed depends those several Experiments, where the Corn or Seed hath yielded so prodigious an Increase, as that one Grain of Wheat should yield a hundred and fourteen Ears, and in them six thousand Grains: but in case it generally hold to be but a quarter of the number, it is beyond what any other way of Husbandry can perform.

But for the imbibing or steeping of Corn, or any other Seeds in rich Wines, or Spirit of Wine, it will not succeed, those things being of too hot a nature, and too soon excite the Vegetable Faculty.

Picking of
Seed.

It is no small advantage to pick or cull out the best Seed, for the Seed that grows in the middle of the Ear is the best, and that which grows on the principal Stalk is the best, and doubtless yields the fairest increase: This is no new opinion, as may be observed in *Virgil*,

*I saw Seed pick'd and cull'd with tedious pain,
And yet degenerate, unless yearly we
The largest chuse: each thing by destiny
So hastens to grow worse*

Gardners

Gardners usually preserve the fairest Plants for Seed, and then select the fairest Seed; from whence they have their suitable and proportionable encrease: therefore it may not be labour lost to use the same method in picking of Wheat.

Some have strain'd a Wimsheet athwart a Barns Floor about the middle thereof, and with a Scoop or Shovel cast their Wheat against the upper part of the Sheet; by which means the heaviest Grain have been cast over, and the lighter fallen on the nether side of the Sheet. Other ways may be tryed for the deciding the better from the worse, but I leave them to the ingenious Country-man to discover.

and of the several ways of improving the Land, by burning, and by the use of New Hays, Grasses, and the best sort of Corn, &c. and by the best way of Tilling and Ordering the same. Now it will be necessary to say a little concerning this most beneficial way of improvement by burning, and the several ways of tempering, altering, newing, or adding unto the Land, or applying any subject whatsoever thereunto for its improvement and Advantage.

SECTION I.

Of the Burning of Land.

The burning of Land, or any other operation on it by Fire, seems to be the greatest, though not most universal advantage to most of our barren, poor and hungry Lands, as well dry as wet: The burning of the Ground, it self seems to be of very ancient use, as appears by

CHAP. 3.

Of the burning of Land, and the several ways of improving it.

And burning of Wood, and other combustible Materials on Land, is practised amongst the Americans for the improvement of their Land; which is an Argument as well of their Natural Ingenuity, as of the necessity and advantage of the improvement. For the burning of such combustible things on Land, doth very much heat the Ground, and waies that Acid Juices that hinder Fertility, and the tree that is burning Principle the way which before the most part was bound up: and it leaves a good quantity of that Salt on the Land mixed with the Ashes, which is generally held to be the only advantage this way yields, though the contrary appears, for where ever the fire is made, although you remove the Ashes wholly, yet will the place bear a better Crop than where you bestow the Ashes, as formerly we noted.

This Art of Burning of Land, usually called Despoiling (quasi Despoliandum) or Despoiling, because it seems there to be most used, or to have been invented) or burn beating, is not applicable or necessary to all sorts of Land: for in a good, fertile, rich, loose Soil, where a good sweet Grass, or good Corn flourisheth, it waies as well the good as the bad Juice: wherefore in most places in some of these, and such other fertile places, they reject it. But for barren, sour, heathy, and rusty Land, be it either hot or cold, wet or dry, it is a very great improvement, inasmuch

On the
way of the
West-Indies

On the
Land burn-
beating good.

CHAP. V.

Of the Manuring, Dunging, and Soyling of Lands.

HAVING discoursed of *Meadows*, *Pastures*, and *Arable Lands*, and of the great Advantages and Benefits that are raised out of them, and of the several ways of Improving *Meadows* by drowning or watering, and of *Pastures* and *Arable Lands* by Inclosure, by sowing and propagating New Hays, Grasses, and the best sorts of Corn, Pulse, and other Seeds, and by the best way of Tilling and Ordering the same: Now it will be necessary to say a little concerning this most general way of Improvement by *Manuring*, *Dunging*, and *Soyling* of Land; under which terms we comprehend all the several ways of tempering, altering, renewing, or adding unto the Land, or applying any subject whatsoever thereunto for its Improvement and Advantage.

S E C T. I.

Of the Burning of Lands.

The Burning of Land, or any other operation on it by Fire, seems to be the greatest, though not most universal advantage to most of our barren, poor and hungry Lands, as well dry as wet: The burning of the Ground it self seems to be of very ancient use, as appears by *Virgil*:

Q. A. H. *Sape etiam steriles incendire profuit agros.*

Gages Survey of the West-Indies.

And burning of Wood, and other Combustible Materials on Land, is practised amongst the *Americans* for the Improvement of their Land; which is an Argument as well of their Natural Ingenuity, as of the Excellency and advantage of the Improvement. For the burning of such Combustible things on Land, doth very much heat the Ground, and wastes that Acid sterile Juice that hinders Fertility, and sets free that fertile Principle the *Sal terra* which before for the most part was bound up; also it leaves a good quantity of that Salt on the Land mixed with the Ashes, which is generally held to be the only advantage this way yields, though the contrary appears; for wheresoever the Fire is made, although you remove the Ashes wholly, yet will the place bear a better Crop than where you bestow the Ashes, as formerly we noted.

On what Lands burning good.

This Art of Burning of Land, usually called *Denshiring* (quasi *Devonshiring* or *Denbighshiring*, because it seems there to be most used, or to have been invented) or burn-beating, is not applicable or necessary to all sorts of Land: for in a good, fertile, rich, loose Soyl, where a good sweet Grass, or good Corn flourisheth, it wastes as well the good as the bad Juice; wherefore in most places in *Somersetshire*, and such other fertile places, they reject it. But for barren, sour, heathy, and rushy Land, be it either hot or cold, wet or dry, it is a very great Improvement, infomuch

insomuch that most sorts of such poor Lands will yield in two or three years after such Burning more above all charges, than the Inheritance was worth before.

The most usual Method is, with a Breast-plough to pare off the Turf, ^{Manner of burn-beating.} turning it over as it's Cut that it may dry the better; if it prove a very dry season and the weather hot, then it needs no more turning; but if the weather be casual, it must be turned, and the Turfs set a little hollow, that they may dry the better, and when they are through-dry, they may be laid on small heaps about two Wheel-barrow loads on a heap: the lesser the heaps are the better, so there be enough to make a good Fire throughly to consume the whole to ashes. If the Turf be full of fibrous roots, or hath a good head on it, it will burn without any other additionary fuel; if not, you must raise your heap on a small bundle of Ling, Goss, Fearn or such-like, which in some places they call Ollet, which will set the whole on Fire: you may afterwards let those little hills of *Ashes* lie till they are a little saddned with rain, before you spread them, or take a quiet time that the wind may not waste your ashes, nor hinder their equal scattering; also you must pare the ground under the *hills* somewhat lower than the surface of the Earth, to abate its over-great fertility, caused by the Fire made thereon. It is also to be observed that the Land is to be but shallow or half Ploughed, and not above half the usual quantity of Seed sown on an Acre, and that also late in the year: If Wheat, towards the end of *October*, only to prevent the excessive rankness or greatness of the Corn, by which you may judge what advantage Burning is to the Land, and this also on the poorest Plains or Heaths.

You must note, that in burning your Turf you do not over-burn it: that is, that you do only burn it that it will break and spread well: for if you burn it too much, or into white ashes, you do waste the Nitrous Salt. Although the middle part of your Hill will be more burnt than the outward, yet may you so order it, by applying little Combustible matter to the Hill, that it shall not burn too fast: for the slower the Fire, the better it fixes the Salt.

Others there are that when they stubb up their *Goss*, *Broom*, and such-like, lay the Roots on heaps when they are dry, and cover them with the parings of the Earth between, where they raised the Roots, and so Burn over the Land, which is also a very considerable Improvement.

In some places also it is usual to Burn the Stubble and other trash they can rake together on their Lands, which must needs be very good so far as may be according to the quantity thereof, although it be not so much used for fertility sake, as to rid themselves of the stuff, for they usually burn Heaths and Turf-Commons to give liberty to the Grass.

Sir *Richard Weston* gives this for a good way, that is, First pare off the Heath, [or Turff,] then make the parings into little Hills: you may put to one Hill as much paring as comes off from a Rod or Pole of Ground.

The Hills being sufficiently made and prepared, are to be fired and burnt into Ashes; and unto the Ashes of every Hill you must put a peck of unslaked Lime: the Lime is to be covered over with the Ashes, and so to stand till rain comes and flakes the Lime, after that mingle your Ashes and Lime together, and so spread it over your Land.

Continuatio
Miraculi
Mundi, p. 34.

Page 21.

Other Soyls
& Manures.

In such places where Fewel is not scarce, and the Land barren, it is very excellent Husbandry to get together into such Land you intend to fertilize, all the small Wood, Bushes, Furze, Broom, Heath, Fearn, Stubble, or whatever combustibile matter you can procure, which in most places are easier obtained than Dung; and in a dry time lay it in heaps disperfedly about the ground, and cast over it the parings of the Land where it lies, and set fire to it, and whilst it burns (having several to help you) cast on Turf or Earth on the most flaming parts, to hinder that it flame not too much; the heat of which fires will so calcine the Earth under them, and the Earth cast on them, besides the ashes of the Vegetables, that it will yield an increase far exceeding the charge and labour bestowed thereon: there can be no better use made of these combustibile matters, and especially of the Hawm or strings of Hops, which burnt in the Hop-garden, and the parings of the Turfs on the side of the Garden, or elsewhere, or any other Earth cast over it as it burns, and then more Hawm over that, and more Earth on that, as they use to say, *Stratum super stratum*, till all be done, either in one or several places, will make so excellent a Compost to be applied to the Hop hills, that none can exceed it, which I my self have done; And this answers to what Glauber delivers as a great secret, and very profitable: *Pertica, Longurii, aut pali, quibus Vites lupulorum Caules sustentur, si igne, qua in extremitatem suam inferiorem desunt, adurantur, & extremitate adusta, in lignorum oleum illud immittantur, ut pinguedinem illam imbibant, &c. duplex hoc pacto emolumentum afferentes; prius est quod pertica à putredine conservata quotannis breviores non evadant, sed diutius durent: Alterum quod vitium & lupulorum radices pinguedinem & alimentum ex perticarum extremitatibus attrahentes luxuriantie incremento excrescant.* By which it appears, that the ends of the Hop-poles only being burnt and imbibed in his *Vegetable Oyl*, or *Fixed salt*, will not only endure long from rotting, but also will yield extraordinary nourishment to the Roots of the Hops; of such wonderfull efficacy is this subject, that the least Grain thereof carrieth with it much of fertility, as the same Author saith a little before of the same Subject; *Non tantum in agris præstat, sed etiam arboribus, & vitibus, adeo ut una eodem plena tonna tantum ad agrorum stercorationem conferre valeat, quantum decem fimo equino, aut vaccine repleta plaustra solent.*

This kind of *Manure* either by Burning as before, or with the fixed Salts of any thing whatsoever, doth also much more enrich your Crop than any other Dung or Soil, for this tendeth principally unto fertility, ordinary Dung of Beasts more unto the gross substance of the Straw or Hawm, than unto Fruit or Seed, and also breeds more of Weeds than this our *Universal Subject*.

There are also several other sorts of Materials to be used, as Soils and Manures for the fertilizing and enriching of Lands: Some whereof are taken from the Earth, as *Chalk, Marle, Clay, &c.* Others from the Waters, as Sands, Weeds, &c. Others also are the Dungs and Excrements of living Creatures, and others that are several sorts of Vegetables themselves, and other casual things, as Soot, Rags, &c. Of all which we find these whereof we shall now treat, to have been found out and commended to be useful and beneficial to the Husbandman for the purposes before mentioned.

SECT. II.

Soyls and Manures taken from the Earth.

Whereof there are several sorts; some of so hard and undissoluble a nature, that it is not fit to lay on Lands simply as it is, but after it is burned into *Lime*, becomes a very excellent Improver of Lands: there are also other sorts of *Chalk* more unctuous and soluble, which being laid on Lands crude as they are, and let lye till the Frosts and Rain shatter and dissolve the same, prove a very considerable advantage to *Barren Lands*; now where any of these *Chalks* are found, it is good to prove their natures, by laying them on some small portion of Land crude as they are, or by burning them into *Lime*, if Fewel be plenty, or to half burn them; by which you may experimentally know the true effects and benefits that Subject will yield.

Of Chalk.

And although *Chalk* simply of it self either burnt or unburnt, may not prove so advantageous as many have reported, yet is it of very great use to be mixed with *Earth* and the *Dungs* of Animals, by which may be made an admirable, sure, and natural fruitful Composition for almost any sorts of Lands, and raiseth Corn in abundance.

Liming of Land is of most excellent use, many barren parts of this Nation being thereby reduced into so fertile a condition for bearing most sorts of Grain; that upon Land not worth above one or two Shillings an Acre well husbanded with *Lime* hath been raised as good *Wheat*, *Barley*, *white* and *gray Pease* as *England* yields. *English Improver.*

Of Lime.

Also that by the same means from a *Ling*, *Heath*, or *Common* naturally barren and little worth, hath been raised most gallant *Corn*, worth five or six Pounds an Acre, by the same Author.

He also affirms that some men have had and received so much profit upon their Lands by once *Liming*, as hath paid the purchase of their Lands, and that himself had great advance thereby, yet lived twenty miles from *Lime*, and fetched the same by Waggon so far to lay it on his Lands.

One Author saith twelve or fourteen quarters will *Lime* an Acre; another saith 160 Bushels: the difference of the Land may require a different proportion.

The most natural Land for *Lime* is the light and sandy, the next mixt and gravelly; wet and cold gravel not good, cold clay the worst of all.

Also a mixture of *Lime*, *Earth*, and *Dung* together, is a very excellent Compost for Land.

Marle is a very excellent thing, commended of all that either write or practise any thing in Husbandry. There are several kinds of it, some *Stony*, some *Soft*, *white*, *gray*, *rufset*, *yellow*, *blew*, *black*, and some *red*: It is of a cold nature, and saddens Land exceedingly; and very heavy it is, and will go downwards; though not so much as *Lime* doth. The goodness or badness thereof is not known so much by the colour, as by the Purity and Uncompoundedness of it; for if it will break into bits like a *Dye*, or smooth like *Lead Oar*, without any Composition of *Sand* or *Gravel*; or if it will flake like *Slate-stones*, and flake or shatter after

Of Marl.
Differences
of Marl.

Signs of good
or bad Marle.

Best way to
know Marle.

a shower of Rain, or being exposed to the Sun or Air, and shortly after turn to dust when it's thoroughly dry again, and not congeal like tough Clay, question not the fruitfulness of it, notwithstanding the difference of colours, which are no certain signs of the goodness of the Marle. As for the Slipperiness, Viscousness, Fattiness, or Oyliness thereof, although it be commonly esteemed a signe of good Marle, yet the best Authors affirm the contrary, viz. That there is very good Marle which is not so, but lieth in the Mine pure, dry and short, yet nevertheless if you water it, you shall find it slippery. But the best and truest Rule to know the richness and profit of your Marle, is to try a Load or two on your Lands in several places, and in different proportions.

Use and Benefit of
Marle.

They usually lay the same on small heaps, and disperse it over the whole Field, as they do their Dung; and this Marle will keep the Land whereon it is laid, in some places ten or fifteen, and in some places thirty years in heart: it is most profitable in dry, light, and barren Lands, such as is most kind and natural for Rye, as is evident by Mr. Blisher's Experiment in his Chapter of Marle. It also affordeth not it's vertue or strength the first year, so much as in the subsequent years. It yields a very great Increase and Advantage on high, sandy, gravelly, or mixed Lands, though never so barren, strong Clay-ground is unsuitable to it: yet if it can be laid dry, Marle may be profitable on that also.

It is very necessary in Marling Lands to find out the true proportion; how much on every Acre, that you add not too much, nor too little, (*in medio virtus*.) It's better to erre by laying on too little than too much, because you may add more at pleasure, but you cannot take away; the surest way is to try some small quantities first, and proceed as your Experiments encourage. It hath been also experimentally observed, that you are to lay your Marle in the beginning of Winter on hard and binding Grounds. And on the contrary, you are to lay it in the Spring on light, sandy, dry, and gravelly Lands, but it's good to try both; it's held to be best to lay it abroad in the beginning of Winter, that the Frosts may first make the same moulder into small pieces, and so become apt for Solution, which is done by the Rains that more plentifully fall in the Winter.

Of Fullers-
Earth.

You shall observe (saith Markham) that if you cannot get any perfect and rich Marle, if then you can get of that Earth which is called Fullers-Earth, and where the one is not, commonly the other is, then you may use it in the same manner as you should do Marle, and it is found to be very near as profitable.

Mr. Bernhard Palissy (that French Author cited so often by Sir Hugh Platt) commends the same; I have not known it at any time practised in England for the bettering of any ground, (saith Sir Hugh Platt) but by all presumption the same must of necessity be very rich, because, it is full of that Vegetative Salt, which appears in these scouring effects, for the which it is divers ways had in use amongst us.

Of Clay.
Fetel-house
of Art and
Nature.

Clay is by many commended to be a considerable Improvement to some sorts of light and sandy Ground, as Sir Hugh Platt gives the relation of a certain person that assured it to be most true, that the very Clay which he digged up in St. Georges Fields being laid upon his Pasture-ground which he there held by Lease, did exceedingly enrich the same, inso much as he did never regard to seek after any other Soil.

Also

Also Mr. *Gabriel Platt* relates that he knew light sandy ground which was good for little or nothing, cured by laying thereon a great quantity of stiff *Clay-ground* which converted it to good temperament, whereby it became fruitful, and not subject to fail upon every light occasion as it did before, but would abide variety of weather, according to the nature of *Hafel-ground*: And this Improvement (saith he) is of no little value, for there is a great difference betwixt Land that is subject to fail once in two or three years, and Land thus Improved that will not fail once in two or three and twenty years through the distemperature of the weather.

Mr. *Bernhard* also affirms that all *Marle* is a kind of *Clay-ground*, and it should seem to differ only in digestion from *Marle*.

It is good to try it on several grounds both Arable and Pasture, and for several Grains at several times in the year, and in several proportions, by this means you may find out the true value and effect of this, and by the same Method of all other *Subterranean Soyl* or *Manure*, and thereby raise unto your self a considerable advantage.

By the same Rule, and for the same Reason that *Clay* advanceth the *of Sand*. benefit of light and sandy grounds, may *Sand* be an Inrichment and Improvement to cold *Clay* grounds, as Mr. *Gabriel Platt* testifieth that he hath known stiff *Clay grounds* that would seldom be fruitful unless the season of the year proved very prosperous, to have been cured by laying thereupon a great quantity of light *Sandy* ground, which afterwards was converted to a good temperament, like to the sort of ground commonly called *Hafel-ground*, which seldom or never faileth to be fruitful.

The best *Sand* for fertility is that which is washed from the hills or other *Sandy* places by the violence of *Rain*; other *Sands* that are digged, have little fertility in them, only by way of contracting to *Clay-ground* they may effect much, as *Columela* saith, that his Grandfather used to carry *Sand* on *Clay*, and on the contrary to bring *Clay* on *Sandy* grounds, and with good success.

Sand also is of great use to be mixed with *Soil*, as Mr. *Blith* adviseth; for the speedy raising of great quantities of *Soil* in the Winter by the sheep when foulding is generally neglected; and that is by making a large Sheep-house for the housing of Sheep in Winter, which may be Sheep-cribbed round about and in the middle too, to fother them therein: you may bring herein once or twice a week several Loads of *Sand* either out of the Streets or ways, or from a *Sand-pit*, and lay it three or four Inches thick, and so continue once or twice a week as long as you please; and what with the heat and warmth of their bodies, and the fatness of their Dung and Urine, the *Sand* will turn to excellent rich *Soil*, and go very far upon Land, and be more serviceable then you can conceive.

There are several sorts of *Earth* that are of singular use for the better *of Earth*. ing of Land, as all *Earth* of a Saltish nature is fruitful; especially all such *Earth* as lies dry covered with Hovels or Houses, of which you make Salt-petre, is rich for Land, and so are old Floors under any Buildings.

Mr. *Platt* affirms that he hath known many hundred Loads of *Earth* sold for twelve pence a Load being digged out of a Meadow near to *Hampton-Court*, which were carried three or four miles to the higher grounds, and fertilized those grounds wonderfully, and recompensed

the labour and charges very well; which *Earth* being laid upon Arable Land within a Furlong of the same Method did more hurt than good; which sheweth that the *Earth* must be of different nature from the Land whereon it is laid.

Also any sort of *Earth* may be made use of for the folding of Sheep thereon under a Covert, after the *Flanders* Manner, as before is said of Sand.

All sorts of *Earth* are very useful to intermix with Lime, Dung of Beasts, Fowl, or any other fatty substance being laid, *stratum super stratum*, in pits or on heaps to putrifie together, as well to moderate the quality as to increase the quantity of your Soil.

Street-dirt in Towns and Villages is an excellent Improver of several sorts of Land, especially the light and sandy.

SECT. III.

Soyls taken from the Sea or Water.

Of Water-Sand.

The richest of all *Sands* is what comes from the *Sea-coasts* and the *Creeks* thereof, and all Lands bordering on the Sea may be improved by them; it is the usual practise in the Western parts of *England* for the people to their great charge in carriage to convey the *Saltish Sands* unto their barren grounds, whereof some of them do lie five miles distance from the Sea, and yet they find the same exceeding profitable, for that their Inheritance is thereby enriched for many years together, the greatest virtue consisting in the Saltishness thereof.

Others say the Richness of the *Sands* is from the fat or filth the *Sea* doth gather-in by Land-floods, and what the Tide fetches daily from the shores, and from fish, and from other matters that putrifie in the *Sea*, all which the Waters casts on shore, and purgeth forth of it self, and leaves in the *Sands*, while it self is clean and pure.

The *Sands* of fresh *Rivers* challenge also a place in our Improvements, being laid on Land proper for the same, but more especially if it be mixed with any other matter, as most usually it is, where it is cast on shelves at the falls of some Land-waters descending from Hills or High-ways.

Of Sea-Weeds and Weeds in Rivers.

In *Devonshire* and *Cornwal*, and many other parts, they make a very great Improvement of the *Sea-weeds* for the Soiling and Manuring of their Land, and that to a very great advantage.

All manner of *Sea-Owse*, *Owse mud*, or *Sea-weed*, or any such-like, growing either in the *Sea* or fresh *Rivers*, whereof there is a very great quantity lost and destroyed, are very good for the bettering of Land.

In *Cornwal* there is also a Weed called *Ore-weed*, whereof some grows upon Rocks under high water-marks, and some is broken from the bottom of the *Sea* by rough weather, and cast upon the next shore by the Wind and Flood, wherewith they Compost their Barley-Land.

Of Snayl-Cod, or Snag-greet.

It lieth frequently in deep *Rivers*, it is from a Mud or Sludge, it is very soft, full of Eyes and wrinkles, and little shells, is very rich; some they sell for one shilling two pence the Load, another sort they sell for two

two shillings four pence the Load at the Rivers-side, which men fetch twenty miles an end for the Inriching of their Land for Corn and Grass, one Load going as far as three Load of the best Horse or Cow-dung that can be had: It hath in it many Snails and Shells, which is conceived occasioneth the fatness of it.

I am very credibly informed that an Ingenious Gentleman living near the Sea-side, laid on his Lands great quantities of Oyster-shells, which made his Neighbours laugh at him, (as usually they do at any thing besides their own clownish road or custom of ignorance) for the first and second years they signified little; but afterwards they being so long exposed to the weather, and mixed with the moist Earth, they exceedingly enriched his Lands for many years after: which stands also with reason, the Shells of all such Fish being only Salt congealed into such a form, which when it is dissolved of necessity must prove fertile.

There is in most Rivers a very good rich Mud of great fruitfulness, and unexpected advantage; it costs nothing but labour in getting, it hath in it great worth and vertue, being the Soil of the Pastures and Fields, Commons, Roads, Ways, Streets, and Backsides, all washed down by the Flood, and settling in such places where it meets with rest.

There is likewise very great fertility in the residence of all Channels, Ponds, Pools, Lakes, and Ditches, where any store of Waters do repose themselves, but especially where any store of Rain-water hath a long time settled.

In Foreign parts where Fish are plenty they prove an excellent Manure for Land; in some places here in England there are plenty of some sorts of Fish, and at some seasons not capable of being kept for a Market, it were better to make use of them for our Advantage than not; I presume they are of the best of Soils or Manures, but herein I submit to experience.

Doubtless there is not any thing that proceeds from the Sea, or other Waters, whether it be Fish or the Garbish of Fish, Vegetables, Shells, Sands, or Mud, or any such-like dissolving matter, but must be of very great advantage to the Husbandman, if duly and judiciously applied.

S E C T. IV.

Of Dungs or Excrementitious Soyls.

Horse-Dung is the most common of any Dung whatsoever, by reason that Horses are most kept in Stables, and their Soil preserved, yielding a considerable price in most places; the higher the Horses are fed, the better is the Dung by far: it is the only Dung in use, whilst it is new, for hot Beds, and other uses for the Gardiner.

Next unto the Horse-dung is Cow-dung, whereof by reason of its easie solution, hath been made the Water wherein Grain hath been steeped, and hath deceived many a plain meaning Husbandman, for there is not that richness nor vertue therein as many judge, for that purpose.

But this, together with Horse-dung, or other Dung, is of very great advantage to Land if it be kept till it be old, and not laid abroad exposed to the Sun and Wind, as is the practise of the several ignorant Husbands,

Husbands, letting of it lye spread on their Field Lands three or four of the Summer-months together, till the Sun and Air hath exhausted all the vertue thereof; which if it be laid on heaps with Earth mixed therewith, and so let lie till it be rotten, it will be the sooner brought to a convenient temper, and on Pasture Grounds brings a sweeter Grass, and goes much farther than the common way, and spread before the Plough produces excellent Corn: It is also to be used with Judgment; for ordinary Dung used the common way in some years doth hurt, and sometimes makes Weeds and trumpery to grow, which ordered as before, is not so apt for such inconveniences. Of all Beasts, Sheep yield the best Dung, and therefore is most to be esteemed; it is a very high Improvement to the common Field-Lands, where there is a good flock duly folded on them, especially where it is turned in with the Plough soon after the Fold: the only way to Improve your Sheeps-dung to the highest advantage, is to fold them in a covered Fold with intermixture of Earth, Sand, &c. as before, and by this means we make our Sheep enrich most of our barren Lands.

Of Sheeps-
Dung.

Sheeps-dung is very excellent being dissolved wholly (as it will be if well squeezed) to steep Grain therein, for the Grain doth very eagerly imbibe the whole quantity of the Dung into it self, except only here and there a treddle undissolved, and proves a great Improvement if rightly ordered.

Great quantities of this Dung might be obtained, if poor Women and Children were imployed to pick up the same on the Rode-ways, and burning tops of Hills; where it seldom doth any good, but would prove much more advantageous than the cost or trouble, by far.

Of Swines-
Dung.

This hath in former Ages been esteemed the worst of Dungs, very hurtfull to Corn, a Breeder of Thistles, and other noisome Weeds,

English
Improver.

But our late Husbands (whose experience I rather credit than an old vain Tradition) say 'tis very rich for Corn or Grass, or any Land; yea, of such account to many ingenious Husbands, that they prefer it before any ordinary Manure whatsoever, therefore they make their Hog-yards most compleat, with an high Pale paved well with Pibble or Gravel in the bottom, &c. they cast into this Yard their Cornish Muskings, and all Garbidge, and all Leaves, Roots, Fruits, and Plants out of Gardens, Courts and Yards, and great store of Straw, Fearn, or Weeds for the Swine to make Dung withal; some Hog-yards will yield you forty, some sixty, some eighty Load of excellent Manure of ten or twelve Swine.

It's most likely that this Manure so made by these large additions, is more natural and kindly to Land, than the bare Swines-dung it self; and must of necessity prove a very high advantage, considering the despicable vile state of this Beast.

Lands that are hot and burning, may be allayed with this Dung, being esteemed the coldest of Dungs; and it is the best of Dungs to prevent or cure the Canker in Trees, but ought to be covered with the Earth lest it produceth too great a plenty of Weeds.

Some good Daries will make the Soil of their Hog-yard produce them twenty or thirty pounds worth of profit in a year.

Of

Of the Manuring of Land.

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Of the Dung of Fowls.

This challengeth the Priority not only of the Dung Fowl, but of ^{of Pigeons} all other Creatures whatsoever. ^{dung.}

Pigeons or Hens dung is Incomparable, one Load is worth ten Load of other dung, and therefore its usually sown on Wheat (or Barley) that lieth afar off, and not easily to be helped; its extraordinary likewise on a Hop-garden.

A Load of Pigeons dung is more worth than twenty Shillings in many parts; a very excellent Soil for a cold moist-natured Land.

I have caused it to be sown by hand after the Grain is sown, and in the same manner, and then harrowed in with the Grain, and received a very great increase on poor Land.

I have known (saith *Plat*) a Load of Pidgeons-dung fetched fixteen miles, and a Load of Coales given for it; which in the Soil where it was fetched would have done more hurt than good for the Manuring of Land, yet where it was carryed, it did as much good for the fertilizing of Land as double the charges: In the one Soil is cured the barrenness, and in the other it poysoned the fertility.

This Dung is of less esteem, because it is not obtained at so easie a rare; and where it is, its generally little set by, because our Fore-fathers did not make any great matter of it, and because they understand not the strength and power of it; for when they take it out of the houses its of a very hot nature, and must needs Injure some things, if laid thereon: but if it be mixed well with common Earth, Sand, or such-like, and let lie till it rot well together, you will find it a very rich Manure, and of value to answer a great part of your Poultreys expence. ^{of Hen-dung.}

I have known a Quince-tree whereon Poultry always peached, that by reason of the Rain washing to its Roots the salt and fatness of the Dung, did bear yearly an incredible number of very excellent Quinces.

This hath been held by the Antients to be most hurtful and unprofitable to any Grounds. They say that to good Grass they are a great enemy, for their Dung and treading will ^{Of Goose-}purify it, and make it worse ^{dung} than barren. ^{Markham.}

I have it from a credible hand, that Goose-dung is very advantageous to Corn, it being discovered by a flock of Geese daily passing over thwart a Field of Wheat, making as it were a Lane over the same in the Winter-time, and had nibbled the Wheat clean from the Ground, and dunged it where they went; in which passage the next year proved to be very gallant Wheat, far exceeding any other part of the Field.

Like unto that I have heard, that a flock of Wild-geese had pitched upon a parcel of green Wheat, and had eaten it up clean, and sat thereon, and dung'd it several nights, that the Owner, despair'd of having any Crop that year, but the contrary happened; for he had a far richer Stock of Wheat there than any of his Neighbours had in the Land adjoining, to the admiration of all.

Which demonstrateth that this Dung is of a very hot and fiery nature, which occasioneth that barrenness falsely suggested to be in it; and being laid abroad thin in the Winter-time, proves a very rich Manure, and therefore to be esteemed of; and being mixed with cooling Earths, and let purify some time, may prove very much for your benefit: therefore neg-lect

lest it rot, but make several trials, the Advantage will be your own. The same may be said of the Dung of any other Water-fowl.

of Chines
Explication
Mandip. 30.

Although that Urines are esteemed to be of a destructive and mortifying nature to Vegetables, as *Glauber* affirms, by reason of its *Salarmineal* and burning Spirit that is therein, as is evident to our Senses upon the casting of new Urine on Nettles or other vegetables, it soon destroyeth them: but it is with this, as with many other moist things subject to putrefaction, time will digest it, and alter the nature and property thereof, as it doth Wine or Beer into Vinegar, so it will of this fiery matter produce an excellent Soil, as many have had the experience of.

Mr. *Harlip* testifieth, that in *Holland* they as carefully preserve the Cows Urine as the Dung to enrich their Land. *Columella* in his Book of Husbandry saith, That old Urine is excellent for the Roots of Trees.

I know a Woman (saith *Harlip*) who lived five miles South of *Canterbury*, who saved in a Pail all the Urine; and when the Pail was full, sprinkled it on her Meadow, which caused the Grass at first to look yellow, but after a little time it grew wonderfully.

English Im-
prover.

Another also saith, that Mans Urine is of great worth, and will fatten Land more than you are aware of, and it were not ill Husbandry to take all opportunities to preserve it for Land, and so of all other Urines, after the *Dutch* manner.

Humane Ordure ought not here to be omitted as a rich Soil, if the Husbandman would be so careful as to place his House of Office, that he may once in two or three days add some mixture of Earth, Straw, Stubble, or such like, to reduce it into a necessary substance portable into his Lands or Grounds remote from his Dwelling, where after it hath lain some convenient time in a heap to putrify together, and then thinly dispersed, proves an unexpected Advantage.

SECT. V.

Of several other Soyls or Manures.

Ashes.

Ashes contain in them very much of a rich and fertile Salt, as before we noted, and therefore not so much to be slighted and neglected as they are, be they of what kind or nature soever.

Virgil, ———— *Ne pudet,*

Effatos Cinerem immundum jactare per agros.

The Wood-ashes are the best, and very useful; yet after they have been used in the Bucking of Cloathes, they are worth little, unless it be in cold and moist Land, where I have known them also to avail much.

Sea-coal ashes with Horse-dung make an excellent Compost for divers uses.

Turf and Peat-ashes must needs be very rich, being much after the same manner as the Burning of Land, which most know to be a very great Improvement, and whereof we have already treated.

Ashes are a great Curer of Moss and Rushes in moist Grounds.

The

The Ashes of any sort of Vegetables are very profitable, as divers places in *England* can testify by experience, who consume their Leach, Stubble, Straw, Heath, Furze, Sedge, Bean-stalks, and the very Sward and Swarth of their Ground to ashes; and these according to the store of Salt which their Ashes do contain, do either for a longer or shorter time enrich their barren Grounds.

Mr. *Platt* highly commends Soap-ashes, after the Soap-boller have made what use of them they please, to be a very great enriching to Land; and gives you an instance of a Stalk and Ear of Barley of an Ell and three Inches in length, that grew on barren Land, enriched with Soap-ashes; he also saith he found the like success in Pasture ground.

In *Lombardy* they esteem them much above other Dung.

It is best to lay them either on Corn, or Pasture, or Meadow in the beginning of Winter, that the showers may the easier dissolve them.

Soot also is affirmed by some to be very good, especially that which is made of Wood. It's most beneficial to Trees or Plants that either grow in the shade, or to cold and moist Grounds. Soot.

Common Salt may prove advantageous, if used with moderation and discretion, as well to Salty Sands, Muds, Earths, &c. Some commend very much the Sweeping of a Ship of Salt, or droffie Salt and Brine. Salt.

It is of singular use, as daily experience testifies, being dissolved and Seed-corn steeped therein, to prevent the Smut, and add fertility, as we noted before in the preparation of the Seed.

There is also a relation of one that sowed a bushel of Salt long before on a small patch of barren ground at *Clapham*, which to that day remained more fresh and Green, and full of Swarth, than all the rest of the Field about it: This, though not a beneficial Experiment, by reason of the price of Salt, yet a plain demonstration of the Fertility that is in Salts, and gives us encouragement to make use of the Brines of Salt-pits, or such-like, now in much esteem.

In Rags of all sorts there is good virtue; they are carried far, and laid upon Land, and have them in a warming improving temper: one good Load will go as far as a dozen or more of the best Cow-dung. Rags.

Divers also have found singular profit in the Hair that is gotten from the Hides of Beasts, being thinly laid upon the ground, and suffered to putrifie. Hair, &c.

Also coarse Wool-nippings and Tarry Pitch marks, may be reckoned into the number, having great virtue in them.

Mault-dust is commended for an enricher of barren Land; but because great quantities are not to be had thereof, it is best to be used in Gardens, where you will find it to be of singular use: only it is apt to breed Weeds. Mault-dust.

All sorts of Fearn, Straw, Brake, Stubble, Rushes, Thistles, Leaves of Trees, or any manner of Vegetable trash whatever, either cast into the Yards among the Cattle or Swine, or cast into Pools or places to rot in, or mixed with other Soils, help very much, and make very good Compost. Fearn, Straw, Stubble, &c.

It is not unlikely that the corrupt Pulp or Chaff of any Fruit laid about the Roots of any Trees of the same kind, should advance their Growth and Bearing, because it more easily supplies them with a similar Juice yet remaining in the Pulp or Chaff, which the Fruits or Seeds out of which it was made, had by their Branches & Roots attracted. The Lees of Wine, & the

Grounds or Setlings of Beer, Ale, &c. are of the like nature, but more excellent.

Bones, Horns,
Sinking flesh.

All Marrow-bones, Fish-bones, Horn, or shavings of Horn, or Liquors wherein Flesh or Fish have lain, or any other thing whatsoever, that hath any oilyness or fatness in it, is useful in Husbanding Lands.

It were not much labour to try whether the bones of Horses or other Beasts, whereof there are great quantities at some Dog-kennels, being burnt in heaps, with some small addition of Fewel, would be of good effect to be laid on Lands.

Bark of Trees

There is in all Bark a very rich Salt, but in the Oaken Bark the most, which is made use of principally by Tanners; but Barks or Rinds of Trees not of so high a value, being broken into small pieces, must of necessity enrich either Corn or Pasture-ground being laid thereon: It must needs be much richer than the Mould or Earth usually found in the bodies of old, large, and hollow Willow-trees, that are putrified within, which is esteemed to be so rich and effectual.

Earth in
Willow-
Trees.

Amongst the Cole-Mines they usually dig a kind of Blew or Black Clay, that lies near the Coal, and is as it were an unripe Coal, which the Country-men commonly call *Urry*, which they lay on their Pastures with wonderfull success, and is very proper for warm Lands.

Urry,

Blood.

Blood is very good for all sorts of Land, especially for Fruit, having in it self all the principles of Fertility in the greatest plenty, and most equal proportion.

Saw-dust being rotted, or any rotten Wood whatsoever mixt with Earth, makes heavy Land light, and fertilizes it exceedingly.

Labour.

There are some sorts of Land that are in themselves rich, but their riches are bound up by the stubbornness of their Clay'y surfaces, for which Labour seems to be the best Soil.

*And who athwart the Furrows plows the Plain,
Then breaks the Clods obliquely over again,
Turning his Team, and by Eternal Toil
T'obedience brings a disobedient Soil.*

Virgil.

For a good fat Clay exposed to the Sun and Air, will dissolve like Marle into a more Earthly Substance, and without any manure, or other Culture than Labour, will produce a plentiful Crop.

There are other sorts of Land that ly remote from any Dung or Soil, or at least difficult to be conveyed unto it, that may be much amended by Labour, that is, by often Plowing and Turning of them; as is evident, that Earth often digged and skreen'd in a Garden, produces the best Tillage; which is also the principal reason that Digging or Plough-trenching of Land, makes it more fruitful than the ordinary way of Ploughing.

Dung-mere.

All the Dungs and Soils before-mentioned are improvable by mixing and digesting them the one with the other. I know it is a common way in most places, to lay Dung in heap till it rots, and then spread it on the Land, which is much better than to spread it whilst it is new; but the way that is most profitable to the Husbandman, is to make near his House or Barns, a large pit in length and breadth according to his stock of Soil he is capable to make, and so prepare it at the bottom with Stone, Chaulk or Clay, that it may detain Water or the moisture of the Dung, And

and so posited, that the Sinks, Gutters and Drips of his House and Barns or other water may run into it. Into this Pit let him cast his Water, Fodder, Litter, Dung, Weeds, &c. and there let them lie and rot together, till either the over-quantity of the Soil in the Pit, or his occasion for it abroad oblige him to remove it.

For it is to be observed that the moister your Dung mixed lies, the better Dung it makes and the sooner.

If you have not such a conveniency of a Pit, or that you are compelled to remove your Dung before it be fit for your use, or that your Land be ready for it; then is the best way to cover it with Turf or other Matter, to prevent that the Sun and Wind do not attract or drive from it much of its virtue.

The well preparing of *Dung mixt*, is a piece of Husbandry not to be slighted; for the more and better your Dung is, the better will your Crop be, and an increase in your Crop will make you an increase of your Dung, and so *ad infinitum*. And on the contrary, a decay in the *Dung-mixed*, creates a sensible decay in your Crop, &c. On which two Points of good or ill Husbandry depends the ruine and fall of the Rents or Values of many Farms in this Kingdom.

CHAP. L.

CHAP. VI.

Of the Benefit, Raifing, Planting, and Propagating of all sorts of Timber-trees, and other Trees usefull either in Building, or other Mechanick Uses, or for Fencing, Fuel, &c.

SECT. I.

Of the Benefit of Propagating Timber-trees, and other Trees in general.

THe Propagation of Woods or Trees is none of the least Improvements that can be made on most of the Lands in *England*, for the particular advantage and pleasure of the Countryman, & in raising the yearly profits of his Farm, and very much advancing the price of the purchase thereof, over and above the Annual gain: and nothing can render a Seat more delectable and pleasant than Wood and Water, but principally the curious Groves surrounding or bordering near it.

What can be more profitable than Woods or Trees? which will thrive and increase on the most barren and unfruitful Land, be it either wet or dry, cold, mountainous, uneven, remote, or never so inapt for any other manner of Culture, where neither, Corn, Grass, or any other necessary or usefull Vegetable will hardly grow, yet may we there perceive the lofty Woods flourish, far exceeding in value the purchase of the Land without them; and instead of injuring the Land whereon they stand, it is much better and capaciated to bear Tillage at the removal of the Trees; also the other bordering grounds yield a greater increase of Corn or Grass, by their defence from the extremity of the cold, and bitter blasts in the Winter, and the scorching drought of the Summer.

And what can be more pleasant than to have the bounds and limits of your own Propriety preserved, and continued from Age to age by the Testimony of such living and growing witnesses, in the Spring yielding a reviving Cordial to your Winter-chilled spirit, giving you an assurance of the approaching Summer by their pregnant Buds, and Musical Inhabitants? In the Summer what more delectable than the curious prospect of the variety of Greenness, dark shades, and retirement from the scorching Sun-beams? The Autumn and Winter also not without pleasure and content for the active Husbandman.

The Delights whereof *Rapinus* thus Sings,

*Or if he please, into the Woods may stray,
Listen to th' Birds which Sing at break of day.*

And

*And these Delights all others so transcend,
That we the City now no more Respect.*

Or the vain Honours of the Court Affect.

But to cool Streams, to aged Groves retire, &c.

And what place can be more displeasing and ungrateful than a naked and dry Seat, lying open to all Winds and Weathers? of which it may be said as once of old *Sarum*:

*Est ibi defectus Lympha, sed copia Creta;
Savit ibi Ventus, sed Philomela silet.*

As for the more particular advantages and benefits of planting Woods Particular
Advantages and Trees, you shall find that

First, it improves and meliorates the Land it self; for those Lands where Woods have formerly stood, and are now grubbed up or taken away, the ground is very good and rich, and bears excellent Corn, or any other Tillage or Grass, although the ground was before the Planting or growing of those Woods barren, lean, and thin, as may appear by the bordering Land on either side of such Woods that were never planted.

Secondly, the annual Profits of most Land planted with Coppice-woods are much greater than if the same Land were used for Corn, Grass or such like: For I have known on a Hill, Land not worth for Corn or Grass above Five shillings *per Acre*, that at twelve years growth, the Coppice-wood thereon growing hath been sold at the rate of Twenty pounds *per Acre*; and at the next Felling at Seven years growth it is like to be of the same value, it coming much thicker, and being better preserved than at the first, which is a very considerable advance of the value or profits; besides, it is not subject to those casualties and hazards that Corn, Cattle, &c. are subject unto: It will also bring in an annual profit, if you divide your Coppice into so many parts as you intend it shall stand years before it be felled, then may you every year fell a part: as if you have ten Acres, you may every year fell one Acre at ten years growth.

The better and lighter your Land is, the greater will your increase be, which may in some sort (if the Land be very good) make good the Improvement: Mr. *Bluh* instances in his *Improver Improved*, of a new Plantation, that at Eleven growth a fall was made, and so much Wood cut upon the same, as was worth or sold for sixty pounds *per Acre* or more; it was much Pole-wood; yea a good part of it made Spars, and some part of it small Building Timber, &c. The Land was worth about ten shillings *per Acre*, digged and planted with Quick-sets.

The same Author also gives very great encouragement for the planting of Poplar, Willow, and Alder, on wet morish, or boggy Land, to the advancement of Land not worth two shillings an Acre, unto five pounds an Acre at seven years growth, which is the least I am confident, if it be carefully ordered.

Thirdly, the Benefit and Advantage is very great that is raised from Timber and other Trees standing singly, and in Hedge-rows, Avenues, or any other way disposed or ordered about your Houses, Lands, Commons, &c. that a man may plant, in a few years himself or his Successors may reap the benefit.

Mr.

Mr. *Blish* gives you an Instance of one that planted one hundred *Ajves*, and at the end of fifty years, sold them for five hundred pound, : And of another that planted so much Wood in his own life, that he would not take 50000 *l.* for them.

We have many Instances, where several of the Gentry in this Kingdom have formerly, and in the memory of Man, planted stately Walks, Rows, and Avenues, near unto their principal Seats, which now are of considerable value; and more in value than the Land they cover; therefore if the same Industry were used to plant the same species of Trees in other places of your Farm, it may surely produce the same effect.

For *Asb*, *Elm*, *Poplar*, *Willow*, and such Trees that are quick of growth, it is a very great profit that is made of them where Fewel is scarce, by planting them in Hedge-Rows, and other spare places, and shrouding them at five, six, eight or ten years growth: they constantly bear a good head, and every time whilst the Tree is in proof, the shrowds increase. They are out of the danger of the bite of Cattle, and require no Fence.

Fourthly, Another main benefit accrews to the industrious Husbandman, from the Propagation of Trees in Hedge-rows, and Out-bounds of his Lands, it gives a check to the fierce cold Winter-blasts which nip the Winter-Corn.

According to *Rapinus* his Advice,

*But on that side which chiefly open lies
To the North wind, whence Storms and Show'rs arise,
There plant a Wood, for without that Defence,
Nothing resists the Northern Violence.
While with destructive blasts o're Cliffs and Hills
Rough Boreas moves;*

Woods also finely refrigerate the Air in the Summer-parching Heats, and qualify the dry and injurious Winds both in Spring and Summer. Let the Champion-Farmers object what they please, there's no Field Champion-Land of that yearly value for either Corn or Pasture, as is the Wood-land: I know no other reason for it than the natural warmth and defence thereof by the Fences and Trees, else why should an enclosed and well-planted piece of several, yield so much more certain Rent than the Land of the like nature in common and open, lying but on the other side of the Hedge, obvious to the injurious Airs, although both converted to the same use.

Fifthly, Trees planted *sparsim* here and there in the Hedge-rows, and other places of your Land, prove an excellent shelter for Cattle in the Winter, to preserve them from cold Storms and Winds, and also in the Summer from the scorching Sun-beams, else would the Cattle destroy more with their Feet than they eat with their Mouths, and lose more Fatness in one hot day, than they gain in three cool days.

More uni-
versal advan-
tages.

These universal advantages also accrew to those Places or Countreys well planted with Woods and Timber.

First, there is a constant supply of Timber for the Building of Ships, the Bulwarks and defence of this Nation, and for the re-edifying of Towns or Houses destroyed by Fire, or other Casualties; and for the Building, Maintaining of, and repairing of all Houses, Barns, and other Edifices.

And also it yieldeth us a continual Recruit of necessary Boots, Instruments and Materials for all our Rural and Mechanick uses; or for our Mills, Carts, Ploughs, &c. and for Turners, Joiners, and other Wooden Trades; also for the maintenance of the Groves or Pits of Lead, Coal, and other Mines under the Earth, that where plenty of Woods and Trees are, they need not be enforced to fetch these Materials afar off, at a great expence and labour. In some places they fetch most of the necessities aforesaid near twenty miles on Horseback, when the Land at the same place where they need it, is as capable of bearing it as the place from whence they bring it.

Secondly, where Woods are raised and maintained, there is a constant supply of Fuel. The difference may be very easily discerned between the Woodlands and the Champion; in the one you have Fuel in every house, as well poor as rich, of good Wood; in the other, the Rich have but little, and that at extraordinary rates, and the Poor none but what they filch and steal from the Rich; or if their honesty exceed their necessity, they either sit and starve with cold, or burn Stubble of Corn or Cowdung dried, or the Parings of the Earth, or such-like, that the other make use of for the Improvement and Manuring their Land,

Thirdly, the Tanners Trade depends upon the Oaken-Trees; therefore where they are scarce, there must of necessity be a defect of that Occupation, which must in fine prove prejudicial to the whole Nation.

Fourthly, Where Beech, Oak, Hazel, and such-like Mast-bearing Trees are in any considerable quantity standing, they yield a very good Food for Swine, of no small value to the Husbandman in such years they take.

I shall therefore give you a brief Catalogue of such Trees as usually flourish in our English Soil; the places they most delight in, the most natural and likely way of Propagation, and their uses, and what other Observations we have met withal concerning them. And First,

SECT. II.

Of Timber-trees in particular.

There is no Timber natural to our English Soil exceeds the Oak, for its Plenty, Strength, and Durableness; Where are better and stronger Ships for the War, than those built of Oak? And what Timber more lasting or stronger than Oak in our Rural Edifices? It is a Tree universally known, and will grow and prosper in any Land, good or bad, Clay, Gravel, Sand or mixed; Warm, Cold, Dry or Moist, as experimentally it appears by its growth in several places of contrary Natures or Tempers; but they do most affect the sound, black, deep, and fast Mould, rather warm than over-wet and cold, and a little rising, for this produces the firmest Timber; although I have known them thrive very well in extraordinary cold, moist, and clay-ground, that a Fun of Timber could not be thence haled unless in the dry and Summer-season, but that the Wheels would sink in the Clay to the Axel-tree. They will also grow, though but slowly, on the high, stony, and barren Hills.

The Oak.

Place.

The

2. p. 20.

The Acorns, or Oaken-Mast, being sown in your Nursery, after they are full ripe, and before they are withered (which will quickly be if they lie open in the Air) will the next Spring yield you plenty of young Plants, which you may order and transplant, as hereafter in the Nursery you shall have Directions.

Or for expedition sake, you may have young Sets drawn by those that seek the Woods for Quick-sets, in such places where Acorns have spontaneously grown, and been sheltered from Cattle till they are fit for a remove; but these prove generally crooked and ill-shaped, and so are to be cut near to the ground when you Plant them, by which means they will emit another shoot more straight.

Let I know

No better means than if from Seed they grow.

'Tis true, this way a longer time will need,

And Oaks but slowly are produc'd by Seed:

Yet they which for the happier shades are blest.

Rapinus.

Oaks also prosper very well in Coppices, being felled as other Under-woods are. It is reported that a Lady in *Northamptonshire* sowed Acorns, and lived to cut the Trees produced from them twice in two and twenty years, and both as well grown as most are in sixteen or eighteen. Also that Acorns set in Hedge-rows, have in thirty years born a Stem of a Foot Diameter.

The several uses of Oaken-Timber of Buildings, and other Mechanick uses is so universally known, that it is but needless to enumerate them. To abide all seasons of the weather, there is no Wood comparable unto it, as for Pales, Shingles, Posts, Rails, Boards, &c.

For Water-works also, it is second to none, especially where it lies obvious to the Air as well as the Water, there is no Wood like it: For Fewel either as it is, or made into Charcoal, there is no Wood equals it.

The Bark also for the Tanner and Dyer, exceeds all other Barks: The very Saw-dust and Ashes also of the Oak challenge a preference, the Mast exceeds any other Mast of the Forrest trees, and is of great use to the Husbandmen in fattening Swine; for in the Forrests and great Woods many Herds of Swine are very well fattened in such years that the Oak yields plenty of Mast; and that Bacon so fed (especially if the Swine are kept up with Pease some time after) is the most delicious meat; for the Hams we have from *Westphalia* and other parts of *Germany* under that name, are of those Swine that feed of this Mast: for their exercise they of necessity use in searching for these Acorns, as well as the natural sweetness of the Fruit it self, very much meliorateth the flesh of these Animals, as it doth of Deer, Hares, Conies, Pheasants, Ducks, and many others, the flesh of them that are wild being by much to be preferred to the tame.

The young Boughs of the lopped Oak in the Spring-time are of equal use to the Tanner, as is the Bark of this Tree, as hath been found by the experience of many Tanners of this Nation within these few years.

The Elm.

The Elm is one of the most easy Trees to propagate, and delighting in moist sorts of ground, excepting Land very dry, hot and parching, shallow Land near Chalk or Gravel; on the tops of Hills it thrives not well, yet it will grow almost in any place.

But

But the places it principally delights in, is the level, light, and loose Land, so that it be moist; on the Banks of such level and fertile grounds, whether they be of Gravel, Earth, or Chaulk, the Elm prospers well.

About the beginning of *March* fall the seeds of the Elm, which being *Propagation* sown in your Nursery, will yield you Plants. But the care and trouble thereof is superfluous, seeing there are newer and more expeditious and advantageous ways known, *viz.* by the Suckers.

Which are produced in great plenty from the roots of the Elm, and may be transplanted into any places: where the Elms grow, great plenty of these Suckers will yearly shoot out of the Earth, if Cattle be kept from them; or if any Elm be felled, the old Roots will yield plenty of Suckers; or if the old Roots be chopped or slit, and slightly covered with light Mould, they will send forth plenty of Suckers, all which may be slipped off, and transplanted even unto any bigness; there being no Tree more easily transplanted, and with good success than the Elm, observing these Cautions, that if you remove them very young, that you cut not off the top, because it is sappy, and the wet will be apt to get in and decay the Plant, being weakened by his removal; but the greater you may be sure to dis-branch, leaving only the stem; some cover also the head of such Elm so cut off with a mixture of Clay and Horse dung.

I have been very credibly informed, that a certain Gentleman in the North-Country, having a desire to raise suddenly a Plump or Grove of Trees about his Mansion-house, there being a great scarcity of Wood in that place, obtained a parcel of Elm-trees, lops and tops, and made Trenches or Ditches in the Earth, and cut his Elm-branches, &c. into several lengths of six, eight, ten, or twenty feet in length, as with best conveniency he could, and buried them singly in the Trenches so digged, and covered them wholly from the one end to the other, leaving only a hole open about the middle of the interred branch; or if it were a long piece, then two open places might be left, out of which places did spring forth several shoots the first year of a very great length; the Winter succeeding, he took these branches or shoots, all, save only the fairest, and which was most probable and likely to thrive, and so filled up the hole about it, by which means they grew to a prodigious height in a few years, that his habitation was compleatly adorned with living aspiring Products of his ingenious attempt. Note, that the true time of this *sepulture* is when the Sap is full in the Tree, when the leaves are newly sprung, for then the great quantity of the Sap that is in the whole branch, forceth it self into those Shoots or Cions, that then have found a passage; also for the succeeding years, the whole Tree in the Earth becomes a main principal nourishing Root to the nimble growing Tree. For it is evident, that if an Elm be felled in the Spring-time when the Sap is up, that then the Tree lying on the ground will spend much of it's Sap in small Soots in every part of it. Much rather if such Tree were buried in a good moist Soil, with only one part of it open to the Air, from which part you expect a flourishing shoot to proceed. Some have with good success buried such Elm-branches about the end of *January* or beginning of *March*; but if the Land be not over-dry, the latter is better.

If the Elm be felled between *November* and *February*, it will be all Spine or Heart, or very little Sap, and is of most singular use in the Water where it lies always wet, and also where it may always dry; it is also a Timber of great use for it's toughness, and therefore used by

Wheel-wrights, Mill-wrights, &c. It is also good to make Dressers, and Planks to Chop on, because it will not break away in chips like other Timber.

The Elm is good Fuel, and makes very good Charcoal; the Branches and Leaves of this Tree are good food for Cattle; in the winter where other Fodder is dear, they will eat them before Oats.

The Elm is also a most pleasant tree to plant in Avenues or Walks, it growing so streight and upright, and mounts to the greatest height of any other Tree in so short a space: It will grow the nearest of any other together, being very sociable, and affecting to grow in company, and spreads it's Branches but little to the offence of Corn or Pasture-grounds; to both which and the Cattle it affords a benigne Shade, Defence, and agreeable Ornament.

This tree is also very flexible, and to be reduced into what form or shape you please for shade and delight; it also springs earlier than most other Forrest-trees.

The Beech.

This tree commonly grows to a great stature, delights most in warm Land, it grows plentifully in gravelly, stony, and sandy Land: great Beechen-woods I have seen on the driest, barren, sandy Lands; they delight on the sides and tops of high Hills, and chaulky Mountains; they will strangely insinuate their Roots into the Bowels of those seemingly impenetrable places.

This Tree is altogether a stranger to most Counties in England; and it is probable that there might be none here when the great *Cæsar* denied that he found any. For many of those great Woods of Beeches may have sprung up after the felling of Oak; as it hath been observed of late years, that where Oak hath been felled the Beech hath succeeded, and that not only here and there a Tree, but in many Acres, and also where no Beech hath been near unto the place, *Spontanea veniunt*, Some places naturally producethem.

If the *Species* of Trees may be wholly extinct, as is reported of the Chesnut, at least from a spontaneous growth; why may not as well a new *Species* naturally succeed? as the Elm, which is reported to be no antient product of our English Soil.

Propagation.

This is raised from the Mast as the Oak, and from young Plants drawn by the Quickset-gatherers, and planted as the Oak; it grows but slow whilst it is young, but when the Beech is gotten a little out of the way, no tree thrives better, nor sooner attains to a large bulk than this tree; and although it be crooked, knotty, and ill-shapen whilst it is young, yet will it overcome all those, and prove a straight and compleat tree.

Use.

It's use is principally for the Turner, Joyner, Upholsterer, and such-like mechanick Occupations, the Wood being of a clean, white, and fine Grain, and not apt to rend or slit: it is sometimes used in Building: it is also very good Fuel, burning clear and light, and makes good Charcoal, though not long lasting: The Mast feeds Swine, Deer, Pheasants, &c. The Wood of this Tree will be cut by an Instrument made for that purpose, into thin and broad Leaves, wherewith they make Band-boxes, Hat-cases, &c. being covered with Paper; this they now do in London, though formerly sent into other Countries for that purpose.

That

That it is a tree of great use in Mechanicks, witness the vast quantities that are in *Hampshire* and some adjacent places, converted into Turners-ware, and weekly sent to *London*. Many of the Instruments used aboard-ship are made of this Timber.

This tree planted in Avenues or Walks yields a most delectable and agreeable shadow all the Summer, few or none exceeding it for colour and shade.

The Leaves also gathered about the Fall, and somewhat before they are much frost-bitten, afford the best and easiest Mattresses in the world to lay under our Quilts instead of Straw, and continue sweet for seven or eight years.

The Ash is a gallant quick-thriving wood, it delights in the best Land, ^{the Ash} and will prove well in almost any sort of Land whatsoever, and will also grow in the hard, barren, mountainous Land, but not so well for Timber, as in Coppice-woods. Pollards shrowded or lopped, refuse no place. The best Ash grows in the best Land, yet it is not convenient to plant them near Plough-lands, for the Roots hinder the Coulter, and exhaust the fertility of the Soil; the dripping also is injurious to Corn.

There is no tree delights more, nor is more beneficial in the Chaulk or White Land than the Ash; for on those white Hills in *Wiltshire*, *Hampshire*, &c. that tree thrives exceeding well, and being sown in the Keys there, would in time prove a very considerable advantage, as well to the private as publick.

It is propagated from the Seed or Keys, which being gathered in *October* ^{Propagation} or after, when they begin to fall, and sown in your Nursery, the next Spring come Twelve-month they will appear, and will afterwards thrive and prosper very well: they are to be removed whilst they are small, because of their speedy deep rooting. Take not off the tops of the small young Ash, because it is a Sappy Plant; but of the greater Sets it's best to cut them near the ground, and then will they send forth new shoots, which will soon supply the defect of the other; which may also be done in all young Ash after they are well settled, and it will cause to shoot large and thriving shoots: I have seen the experience of it in such Plants that stood several years, and every year decayed till cut off at the Roots, and then they did wonderfully thrive.

You may also have Plants drawn by those that draw Quick-sets, &c.

When you intend to raise this tree on Hills or in open Grounds; the best way is to sow the Seeds in the place before or after the Plough; if in Coppices where the Plough cannot pass, then to prick them in amongst the Rides of Hazel or other stuff, which will defend this plant from the bite of Cattle; so that amongst the infinite numbers that thus you may cause to be interred, in a few years you may observe many fair trees to steal up amongst the Under-wood, which you may preserve.

The use of the Ash is almost universal, good for Building, or any other use where it may lie dry, serves the occasions of the Carpenter, Ploughwright, Wheelwright, Cartwright, Cooper, Turner, &c. For Garden-uses also no Wood exceeds it; as for Ladders, Hop-poles, Palisade-hedges, and all manner of Utensils for the Gardiner or Husbandman. It serves also at Sea for Oars, Handspikes, &c. and is preferred before any other.

There is not any Wood so sweet for the Cattle to brouse on as this: Rangers and Keepers of Parks in hard Winters have the experience of it, by brousing their Deer on it, and prefer it before any other. Every Country-man also hath the experience of it, by feeding of Cattle on the fallen Hedges, where the Ashen boughs are first chewed even to admiration before any other, by the tender mouth'd Heifer.

For Firing there's no Wood comparable to it, for a light sweet burning; it will also burn better newly cut than any other Wood.

The only season for setting the Ash for use, is from *November* till the end of *January*; for if the sap be never so little in the Tree, the Worm takes it, and spoils the Wood in a short time.

There is no Timber of so speedy a growth as the Ash; It is related that an Ash at forty years growth from the Key, hath been sold for thirty pounds. Mr. *Blish* also inserts a President of a Nursery of young Ash, that were casually sown by the Wind, that speedily returned to the owner a very great advantage.

Of the Walnut-tree.

Because this Tree is more generally planted for the sake of the Fruit than the Timber, we shall refer it to the Chapter of Fruit-trees; only let you know, that the Timber of the Walnut-tree is of so great use and benefit, that it's encouragement sufficient for the propagation thereof; the Fruit then added makes the encouragement the greater.

This Timber is of universal use (unless for outward Edifices) none better for the Joyner, Upholsterer, Gun-smith, Cabinet-maker, and other occupations; of a more curious brown colour than the Beech or other Woods, and not so obnoxious to the Worm.

Of the Chestnut-tree.

They delight in a light ground or moist Gravel, and will grow in Clay, Sand, and all mixed Soils, upon exposed and bleak places, as more patient of cold than heat.

Propagation.

They are raised from the Nuts, thus: First, spread them to sweat, then cover them in Sand; a month being past plunge them in Water, and reject those that swim; being dried, for thirty days more Sand them again, and plunge them as before; keep them in Sand till the beginning of the Spring, and set them in your Nursery, but they thrive best unremoved; you may also set them in *Winter* or *Autumn*, in or without their husks, and sow them with other Mast for the raising of Coppices.

Use.

The Chestnut-tree growing in Coppices, yields incomparable Poles for the Garden or Hop yard: If it like the ground it will in ten or twelve years time grow to a kind of Timber, and bear plentiful Fruit. The Timber whereof is (next the Oak) one of the most sought after by the Carpenter and Joyner, and is of very long-lasting, as appears by many ancient Houses and Barns built thereof about *Gravesend* in *Kent*.

Being planted in Hedge-rows, or for Avenues to our Country-Houses, they are a magnificent and royal Ornament; and although our Englishmen delight not so much in the Fruit of the Chestnut-tree as other Nations, yet will they yield no small advantage to supply our other occasions.

The Service-tree.

This Tree delights in reasonable good ground, rather inclining to cold than over hot, for in places that are too dry they never bear kindly.

Propagation.

They are raised from the Berries, which being ripe may be sown as other Masts; these will come soon to be Trees, and being planted young thrive exceedingly; the best and speediest way, is to increase them from Suckers or Sets.

The Timber is usefull for the Joyner, and being of a very delicate Grain, is fit for divers curiosities: It also yieldeth beams of a considerable bigness for Building.

The shade is beautifull for Walks, and the Fruit not unpleasant.

SECT. III.

Of several other Trees not so generally made use of for Timber, for Fuel, Coppice-woods, Hedge-rows, &c.

The Birch will grow on any Land, and cannot well be too barren; It will thrive on the hot burning sands, in the cold wet Clay, Marbles, Dags, and Stony places, no place comes amiss to it.

The Birch is altogether produced of Suckers, which being planted at four or five Foot interval, will suddainly rise to Trees; after the first year you may cut them within an Inch of the ground, and they will shoot out very strongly.

It is Usefull for the Turner, and for some rustical Utensils: It makes use of good Fuel, and Charcoal both great and small.

This tree yields the best Sap of any tree in England, and the most in quantity, prepared either with Honey or Sugar into a Wine; which being now frequently made, hath obtained the name of *Birch Wine*, being a very pleasant and innocent Liquor, and retaineth a very fine flavour of the Tree it came from.

Where this Tree plentifully grows, great quantities of this Liquor may be extracted, by cutting off some small branches, and hanging ot Bottles, with the end of the branches in the mouths of the Bottles, into which the Chrystaline Liquor will distill: several Bottles may thus hang on one tree; or by boring or cutting any part of the stem of the tree, and by a Chip or the like, to guide the Sap into the neck of the Bottle: By either of which ways great quantities of this Liquor may be extracted in the month of February or beginning of March when the Sap ascends, and before the spring of the Leaf; it will run freely when the wind is South or West, or the Sun shine warm, but not so if the weather be very cold, or in the night time. Some have reported, that a Birch tree will yield in 12 or 14 days its own weight in this Liquor; I shall not perswade any man to believe it, although it be most evident that a few Trees will yield you a great quantity of it.

This Liquor thus extracted and truly prepared, makes a very delicate repast.

The Maple affects a found and dry Mould, growing both in Woods and Hedge-rows.

It is propagated of the Keys as the Ash.

The Timber is excellent for the Turner or Joyner, for its whiteness, its lightness, and fine Diapred knots, &c.

This tree chiefly desires to grow in cold Hills, and in the barren, and most expsed parts of Woods.

The most expeditious way of raising it, is by Sits of about an inch Diameter, and cut within half a Foot of the Earth; it may also be raised of the Seeds sown in October, which are ripe in August.

It is very hard Wood for the Mill-wright, for Domestique, or Rural Utensils where hardness is required.

Being planted at half a yard interval in a single row, it makes a stately Hedge or Walk in a Garden or Park, growing tall and speedy, Leaved to the very foot of the stem.

*The Quick-beam.
Propagation
and Use.*

It delights in Mountains and Woods, and to fix it self in good light ground.

The Sets may be planted as the Ash, or the Berries ripe in *October* may be sown; it is a quick growing Coppice-wood, is good for some ordinary uses, and for Fuel.

The Hazel.

This tree above all affects cold, barren, dry, and sandy grounds, also Mountains and Rocky Soils produce them; but more prosperously in the fresher bottoms, and sides of Hills, and in Hedge-rows.

Propagation.

They are best raised from the Nut, preserved moist, not mouldy, by laying them in their own dry Leaves or in Sand, and sown about the latter end of *February*: They are also propagated of Sets and Suckers, the young Wands by no means to be cut the first year, but the Spring following, within three or four Inches of the ground; greater Sets may be cut within six Inches of the Earth the first year.

Use.

The use of Hazel-poles and Rods is generally known to the Husbandman, besides for Fuel and Charcoal.

It is the only Plant for the *Virgula Divina*, for the discovery of Mines.

It is a good Ornament for Walks, and yields a pleasant Fruit, but why should we bring this so near us, when we have a much more excellent Plant at as easie a rate? *viz.* The Filbert.

SECT. IV.

Of Aquaticks, or Trees affecting moist and watry places.

The Poplar.

The white Poplar delights in moist grounds, and near the *Margins* of Rivers, but not in the Water as the Willow doth.

Propagation.

They are usually increased by the straight Branches or Pitchers set in the ground, but by no means cut off the top untill they have stood two or three years, and then head them at eight, ten, or 15 Foot high or more, and they will yield in a few years a very considerable shrowd, which Shrowds or Branches may also be transplanted; you may also let them grow upright without topping them, they are then more Ornamental but not so beneficial.

Use.

Its white Wood is of singular use for the Turner, and also for several Rustick Utensils, and for the Gardiner: it makes also Fuel for the Fire.

The Aspen.

This Tree little differs from the Poplar, only it will grow not only in moist but in dry grounds, in Coppices, &c. is propagated by Suckers; but cut not off the tops of the young Cions the first year: its use the same with the Poplar.

The Abele.

The Abele-tree is a finer kind of white Poplar, and is best propagated of Slips from the Roots; they will likewise grow of Layers and Cuttings.

In three years they will come to an incredible altitude: in twelve years be as big as your middle; and in eighteen or twenty arrive to full perfection.

The Alder.

This Plant of all other is the most faithful lover of watry and boggy places. They

They are propagated of Truncheons, and will come of Seeds; but ^{Propagation.} best of Roots being set as big as the small of ones Leg, and in length about two Foot; if you plant smaller Sets, cut them not till they have stood several years. They are a very great Improvement to moist and boggy Land.

The greater Alders are good for uses under the water, where it will ^{Use.} harden like a very stone, but rots immediately where it is sometimes wet and sometimes dry: the Wood is fit for the Turner, and several Mechanick uses; the Poles, and also the Bark are very useful.

The Withy is a large Tree, and fit to be planted on high Banks, be- ^{The Withy.} cause they extend their Roots deeper then either Sallies or Willows.

Sallies grow much faster if they are planted within the reach of the ^{The Sally.} Water, or in a very moorish ground, and are an extraordinary Improvement.

They are smaller than the Sallies, and shorter lived, and require con- ^{Officers.} stant moisture.

The common Willow delights in Meads and Dich-sides, not over wet. ^{Willow.} They may be planted by Pitchers, as the Poplar: those Sets or Pitchers are to be preferred that grow nearest to the Stock, they should be planted in the first fair weather in February, and so till they bud: the ^{Officers.} Officers may also be planted of Slips of two or three years growth, a Foot deep, and half a yard in length, in moorish ground, &c. The Willow may be planted of stakes as big as ones Leg, and five or six Foot long.

These Aquatick trees yield a clean white Wood, fit for many uses, like <sup>Use and be-
nefit.</sup> unto the Poplar; they also yield Poles, Binders, &c. for the Gardiners use: the Officer is of great use to the Basket-maker, Gardiner, Fisherman, &c. they are all good Fuel, and make good Charcoal, they are a very great Improvement to moorish and wet Lands; an Acre at eleven or twelve years growth, may yield you near an hundred load of Wood: no tree more profitable then some of these Aquaticks (according to the nature of the place) to be planted upon the edges of Rivers, and on Banks, Bounds, or Borders of Meads or wet Lands; they yield a considerable head, and ready for shrowding in a few years. Mr. Evelyn relates, that a Gentleman lopped no less than two thousand yearly, all of his own Planting.

S E C T. V.

Of other Trees usually planted for Ornament, or adorning Gardens, Avenues, Parks, and other places adjoining to your Mansion-house, and convertible also to several uses.

This tree is a kind of a Maple, and delights in a good light Garden. ^{The Syeamore.} mould, and will also thrive in any indifferent Land, but rather in moist than dry. It's propagated of the Keys, which being sown when they are <sup>Its Propaga-
tion and Use</sup> ripe, and falling from the trees, come up plentifully the next Spring, and is a tree of speedy growth. Sets also cut from the tree will grow, set in moist ground, or watered well in the Summer; they afford a curious dark and pleasant shadow, yield a good Fuel, and the Timber fit for several Mechanick uses.

The

The Lime-
tree.
Propagation.

The Lime-tree delights in a good rich Garden-Soil, and thrives not in a dry hungry cold Land. It is raised from Suckers as the Elm, or from Seeds, or Berries, which in the *Autumn* drop from the Trees.

We have a fort of *Tilia* that grows wild here in *England*, which almost equals those brought out of *Holland*, where there are Nurseries to raise them straight and comely.

Use.

Sylv.

This Tree is next the *Platanus* hereafter mentioned, of all other the most proper and Beautiful for Walks, as producing an upright Body, smooth and even Bark, ample Leaf, sweet Blossom, and a goodly shade at the distance of eighteen or twenty Foot, their heads topped at about six or eight Foot high: but if they are suffered to mount without check, they become a very straight and tall Tree in a little time, especially if they grow near together, they afford very pleasant dark shade, and perfume the Air in the Months of *June* and *July* with their fragrant blossom, and entertain a mellifluous Army of Bees, from the top of of the morning, till the cool and dark evening compels their return. No Tree more uniform both in its height and spreading breadth.

I have known excellent Ladders made of Lime-tree Poles of a very great length; the Wood may also serve for several Mechanick uses, like unto the other soft and Aquatick Woods.

The Horse-
Chestnut-tree.

Its Propaga-
tion and Use.

This most excellent Tree delights in a rich Garden-mould, or other light Mould not too dry, and easily propagated by Layers: It's a quick growing tree, most pleasant to the eye at the spring, when its clammy Tirpentine Buds break forth into curious divided hanging Leaves; it bears a cluster of beautiful Flowers, and Prospers well in our cold Countrey, and therefore worthy to be taken into our most pleasant Gardens, Avenues, Parks, and other places of delight and Pleasure.

The Fir, Pine
Pinafter, and
Pitch-tree.

They delight in cold, high, and rocky Mountains, where they naturally grow in great abundance, yet will they grow in better and warmer, but not in over-rich and pinguid; if you plant them, you must be careful at first to keep them moist; therefore Land over-hot, Sandy, or Gravelly is not so good.

Propagation.

They are all raised of the Kernels taken out of the Clogs, which being laid in Water some days, and then exposed to some gentle warmth of the Fire, will open, that you get the Seeds out with much facility, which may be sown in your Nursery, or rather where you intend they should grow, especially the Pine, which will hardly bear a remove, unless very young; the Firrs will very easily, and may also be propagated of Slips, as I have been credibly informed.

Use.

The Fir grows tall, streight, and neatly tapering, therefore more uniform for Walks, &c. but the Pinafter bears the proudest and stateliest Branches, with a fairer and more beautiful Leaf: these two excel the rest for any Ornamental use, and are sooner mounted, growing in a few years to a very great height. Mr. *Evelin* gives you the relation of one that shot no less than sixty Foot in height in little more than twenty years: I have seen Presidents of the like nature. For the first half dozen years they make no considerable advance, but afterwards they come away miraculously.

The use of this Timber is so well known to our Ship-wrights, Carpenters, and other Mechanicks inhabiting near the Maritime Coasts, that nothing here need be said.

Out.

Out of these Trees are made Turpentine, Rosin, Tar and Pitch.

The *Platanus* or *Plane* Tree yieldeth us the best of shades, and hath been ever of great esteem, insomuch that some have been so fond, that they have irrigated it with Wine, to make it fruitful, but whether you will be at that expence or not; If it be planted in a moist Ground, it is a quick growing Plant, very pleasant, and to be esteemed above any other Shade; the Leaves are sometimes 16. Inches broad; and of a curious green colour, and delicate shape. It was so rare a Tree in *Italy*, that *Pliny* admired that they would go into another World (*Africa*) to fetch them, and from *Italy* they came into *France*, where such that walked under their Shade, became Tributary to *Rome*; the truth is, it is the most beautiful of Shades.

The *Larch* and *Lotus* are not much in use, yet deserve to be propagated for their rarity, excellent Shade, and durable Timber. The Larch and Lotus.

This curious Tree delights in a warm and dry Land, not so much desiring a rich as a warm place. The Cypress.

It is propagated from the Seed sown in *March*, and easily abides transplantation. Propagation and use.

It is one of the most Ornamental Plants nature affords, and may either stand single, Pyramid-like, or set in Hedges, and clipped to any form you please: we have so little of its Timber here, that we only refer you to the Joyner and Cabinet-maker for its use.

This Tree grows in all extreams; in the moist *Barbados*, the hot *Bermudas*, the cold *New-England*, in the Bogs of *America*, in the Mountains of *Asia*.

It is propagated of the Seeds; is a beautiful Tree: its Timber incomparable, and almost perpetual.

The *Alaternus*, thrives very well in *England*, as if it were natural; is raised from Seeds, is swift of growth, and one of the most beautiful and useful of Hedges and verdure in the world, and yields an Honey-breathing Blossom. The Alaternus.

This Tree delights in a warm fertile Soil, and is propagated of the Berries or Seed sown in the Spring, and also of the Slips set like the Slips of Box. The Phillyrea.

It is a most beautiful Plant, and one of the quickest growth of any, for the raising of *Espalier* Hedges, and covering of Arbors, being always of incomparable Verdure.

This Tree greatly loves the shade, yet thrives well in our hottest Gravel. The Bay-tree.

They are raised of their Suckers, and their Seeds gathered when they are through ripe, in the midst of Winter, and sown in *March*.

The Beauty and Use of this Tree, is commonly known.

This Tree preserves its Verdure best in the shade, but grows any where, is propagated like the Bay, and is one of the most proper and ornamental Trees for Walks and Avenues of any growing. The Laurel.

It grows generally in the barrenest grounds, and coldest of our Mountains, is easily produced of the Seeds, washed and cleansed from their Mucilage, and buried in the ground like Haws: it will be the second year are they peep, and then they rise with their Caps on their Heads; at three years old you may transplant them: they are also Propagated by Plants or Suckers, but they are difficult of growth. The English tree.

The Timber is a very hard wood, and very usefull to most Mechanicks that work in wood; they are also a beautiful Ornament, and a sure Defence against impetuous Winds, and nipping Cold.

Privet.

Privet is a Plant that hath been in request for adorning Walks and Arbors, till of late, other new and more acceptable Plants by degrees begin to extirpate it out of the most modish Plantations, nevertheless it may yet claim a corner in ours.

S E C T. VI.

Of Shrubs and other Trees less useful, yet Planted for Ornament and Delight.

Myrtle.

This Tree requires a Winter-shelter, is raised usually by Slips and Layers, but may be raised of Seeds; it is a very sweet and Pleasant Plant.

Box.

The *Box* is a Plant that hath been much more in use than now it is in the Garden, from whence most banish it by reason of its injurious scent; it deserves to be planted in the more remote parts: it will grow in any indifferent Land, and is increased by Slips; the Tree is a very curious Ornament, and may be reduced to diversity of Shapes and forms, and yields a most excellent wood, than which none is more desired by our Mechanicks.

Juniper.

The Tree is highly commended by Mr *Evelyn* in his *Sylva*, for a Tree that may be formed into most beautiful and useful Hedges, and that one only Tree covered an Arbor capable for three to sit in, seven foot square, and eleven in height, yet continually kept thorn, having been planted there hardly ten years. They are raised of their Berries, which come up in two Months.

Tamarisk.

This tree groweth tall and great, is increased by Suckers and Layers, and is usually planted by those who respect variety and pleasure: the wood also is Medicinal.

Arbor Vita.

It is usually propagated for its pleasant green Leaf, though the cold Winter makes it dark and brown; it is usually planted by Slips and Layers.

Some Flower trees, and other trees of Delights.

There are several Trees that are planted on the edges of Walks, and in spare places in Rural Gardens and Orchards, only for their Ornamental Habits they usually wear in the Spring and Summer, as *Arbor Juda*, *Laburnum*, the *Sena-tree*, *Spanish-Broom*, the *Bladder-Nut*, the *Gelder-Rose*, the *Pipe-tree*, *Paliurus*, *Jesamies*, *Woodbines*, *Virgins-Bower*, the *Strawberry-tree*, *Mezereon*, *Laurus-tinus*, double-flowred *Pomegranats*, *Apples*, *Pears*, *Cherries*, *Peaches*, &c. *Roses of all sorts*, and several other Trees, yielding great variety, pleasure and content to the laborious Husbandman. For the nature, ordering, propagating, and uses of them, and all other pleasant Plants, Flowers and Herbs, I must refer you to those Tracts that peculiarly handle that Subject, my intentions being only to promote the propagation, and encourage the Industrious in their advancing of such Trees, Plants, Grains, &c. that are necessary and profitable to the Countrey-Farmer, although I have a little in this place digressed from my former purpose: but return and give you an account.

S E C T. VII.

Of such Trees that are necessary and proper for Fencing and Enclosing of Lands, Orchards, Gardens, &c. And the best way of raising such Fences.

Seeing that Fencing and enclosing of Land is most evident to be a piece of the highest Improvement of Lands, and that all our Plantations of Woods, Fruits, and other Tillage are thereby secured from external injuries, which otherwise would lye open to the Cattle:

*Texenda sepes etiam, & pecus omne tenendum est,
Præcipue dum fronts tenera, &c. Virgil.*

And also subject to the Lust of vile persons, as old Tusser observed, where Fences and Enclosures were deficient.

What Orchard unrobbed escapes?

O! Pullet dare walk in their Jet?

But homeward or outward (like Apes)

They count it their own they can get.

For which reason we are obliged to maintain a good Fence, if we expect an answerable success to our Labours. I shall therefore enquire out the most proper Trees for that purpose: And first, the *White-Thorn* is esteemed the best for Fencing; it is raised either of Seeds or Plants; by Plants is the speediest way, but by Seeds, where the place will admit of delay, is less charge, and as successful, though it require longer time, they being till the Spring come Twelvemonth ere they spring out of the Earth; but when they have past two or three years, they flourish to admiration.

Next unto the *White-Thorn* is the *Holly*, which claims a preference much before the *White-Thorn*, were it not for its slow growth in its puberty; which may the better be born withal, if we consider the excellency thereof, either for sight, ornament, or defence; for thickness and closeness it may compare to a Wall or Pale, to defend your inclosure from Winds, or the eyes of ill Neighbours; and for its strength against Man or Beast is impregnable; for height or thickness it will answer your desires.

It is raised of the Berries of the Sets, as is the *White-Thorn*, but the Sets are more difficult of growth, unless they are planted late in the Spring, and well watered.

Pyracantha deserves a principal place amongst our Trees for Fences, it yielding a very strong and firm prickly Branch, and ever-green leaves; is quick of growth, and easy of propagation; it is raised either of the bright Coraline Berries, which hang most part of the Winter on the Trees, and lie as long in the ground ere they spring, as the *Haw-Thorn* Berries, or else it is raised of Suckers or Slips.

The *Black-Thorn* (and *Crab* also) yield a very good Fencing-branch, and are raised as the *White-Thorn*.

The Elder.

A considerable Fence may be made of Elder, set of reasonable lusty Truncheons like the Willow, and may be laid with great curiosity; this makes a speedy shelter for a Garden from Winds, Beasts, or such like Injuries, rather than from *rude Idichers*.

Furzes, &c.

Furzes, Brambles, &c. are very necessary for the Planting of dry Banks, where it is difficult to raise a better Fence, and in those places they will maintain the Bank against any Cattle. Furzes are also sown on barren Land, and esteemed a considerable Improvement, the green tops are good food for Horses, the prickliness thereof being taken away by chopping.

The speediest and best way of Planting a Quickset Hedge.

Let your Plants be about the bigness of your Thumb, if you can, and set almost perpendicular, and cut within four or five Inches of the ground, and planted in a double row at about half a foot distance; they will prosper infinitely, and much outstrip the closest range of our trifling Sets.

Another way more usual, and better for the Field.

The other way most followed for the planting of a quick Hedge, is on the Bank of a Ditch thus: place the first row of Sets on the brink of the Ditch in the upper mould and cover them with the better part of the Mould taken out of the Ditch, and raise the Bank about eight or ten inches above them; then place another row of Sets, each Set against the spaces of the first row; then lay more of the best Mould to the roots of the Sets, and raise the Bank as before, and place another row of Sets opposite to the first, applying the best Mould to the Roots, and finish the Bank with the bottom of the Ditch.

Of planting the Holly-hedge.

You may Plant it as the White Thorn; but if you think that too tedious to wait it's rise, you may Plant it with the White Thorn, and let every fifth or sixth be an *Holly-set*; they will grow infallibly with the Quick, and as they begin to spread, make way for them by extirpating the White Thorn, till they quite domineer.

Also you may lay along well-rooted Sets a yard or more in length, and stripping off the leaves and branches, cover them with a competent depth of Earth, and they will send forth innumerable Suckers, which will advance into a Hedge. Holly is one of the slowest, thou best Plant for a Fence.

Preserving of Hedges from Cattle.

All these Hedges being young, should be carefully Fenced with a dry Hedge, from the biting of Cattle on both sides, if need require, until the tops are out of their reach; and where any fail, to supply them in time with new, or to plash the next to fill such vacant gaps.

Weeding of Hedges.

Whilst they are yet young, they are to be constantly weeded, lest the Weeds prevent the thick spreading of the Hedge at the bottom, as well as check the growth and prosperity of the Plant.

Plashing of Hedges.

If your Hedge stand remote, or that you do not annually keep it clipt, whereby it should thicken, then about six years of age you may plash it about *February* or *October*. Some Workmen are more expert and judicious at this than others are, and can better do it than any Pen can direct, therefore I shall not trouble you therewith, but leave you to the skill of the Workman.

Whatsoever you Plant or make your Fences withall, it is a piece of very good Husbandry to Plant at some convenient distance, Setters, either of Timber proper for the Soil, or of Crabs whereon to graff Apples, or Perry-stocks for Pears, as you shall be advised or judge convenient; which will very much improve your Land for the future, and commend the industry of the Planter.

SECT. VII.

Of the Nursery for the more convenient propagation of most of the fore-mentioned Trees.

Several of the said Trees are usually produced of the Seed, Mast, or Berries, and those are the Oak, Beech, Chestnut, Service, Maple, Sycomore, Horn-beam, Quick-beam, Hazel, Firs, Pines, Pinaster, Pitch-tree, Cypress, Cedar, Bays, Laurel, Privet, and Juniper, which being sown, spring the first year; and the Ash, Phylleæa, Ewe-tree, White-thorn, Black-thorn, Holly, and Pyracantha, whose Seeds or Berries usually lye in the Earth another year after they are sown, e're they Spring. Trees produced of Seeds. &c.

To produce Trees immediately of the Seed is the better way: First, because they take soonest: Secondly, because they make the straightest and most uniform shoot, being very considerable in Timber-trees: Thirdly, because they will neither require staking, nor watering, which are two very considerable Articles: And lastly, for that all transplanting (though it much improve Fruit-trees) is a considerable impediment to the growth of Forrest-trees, but if they are removed out of the Nursery whilst they are young, and carefully preserved, this injury is not so great; also Plants raised of the Seed in the place where they are to stand, shall soon outstrip a removed Plant of a greater age, especially the Pine and Walnut, where the Nut set into the ground, shall certainly overtake a Tree of Ten years growth which was planted at the same instant. Best raised of Seed.

Because of the coldness of the Winter, and the damage the Mast, Seed, or Berries may receive from Mice, and other Vermin, it is not good to sowe them till the Spring, for the better preserving them from drying, rotting, or decaying; you may put them into Pots, Barrels, or other Vessels, Sellars, Sheds, or such like places, with a mixture of Earth or Sand, not too dry, intermixed *stratum super stratum*, with the Seeds, &c. At the Spring you will find them sprouted, and being committed to the Earth, as apt to take, as if they had been sown with the most early. Some affirm that by this way of preparing the Seed, &c. those Seeds that otherwise would have lain over another Winter in the ground before they had sprung, being now committed to the ground before the Full in March, will that season be chitting, and speedily take root. Preserving and preparation of Seeds.

Chuse not your Mast or Seeds from the aged, decaying, or not thriving Trees, but from a thriving Tree, of a sound stock, and firm wood, and let the Seed be the most weighty, clean and bright. Election of the Seed.

Make choice of some spare place of ground well Fenced and secured from Cattle, Conies, &c. respecting the South-East rather than the full South, and well protected from the North and West; let the ground be rather dry than moist, for Trees will rarely thrive being removed out of a wet into a dry place, but exceeding well out of a dry into a moist; break up the ground, and prepare it the Winter before you sow it; the cleaner it is from Weeds, and the lighter and mellow the ground is, the better will the Seeds thrive, for in much Weeding the young Plants are indanger'd. Place for a Nursery.

The Nursery for your Firs, Pines, Cypressess, and all such Winter-trees, and tender Plants, had need be sheltered from the Southern Aspect; either artificially, or else made where it is naturally so defended.

You

Manner of
Sowing.

You may make Furrows or Trenches of four or five Inches deep, at about two foot breadth, with a convenient interval for the more commodious weeding and dressing the Plants. Into these Furrows cast your Seed or Mast, such as usually spring the first year in beds by themselves; and such that stay the second, by themselves, or (as it is best for the better ordering them at their removal) sow each Seed or Mast apart, then cover them with a Rake.

The Seeds of *Firrs*, *Pines*, &c. need not be sown above an Inch deep, and covered finely with a Sieve, and duly watered.

If the Seeds of *Pines*, or *Firrs* be rolled in a fine Compost made of Sheeps-dung, and planted, they never fail.

But for the more convenient removal of the Pine (which least abides it of any Tree I know) take small earthen Pots without bottoms, or small Baskets, Boxes, or such like, and set them to the brims in rows in the ground, and fill them with good mould, and plant in each of them two or three Seeds; when they grow, leave only one, and by this means, at two or three years growth may you securely remove them, the Earth being kept fast about the roots; and wherever you plant them, the Tree it self in time will rid it self of the Pot or Box.

Ordering of
the Nursery.

When the young Imps or Seedlings are sprung up, you must be very careful in keeping them from weeds, which else will soon over run them; and after weeding the ground being unseled, give them a little water if it be a dry and hot season.

The winter following you may lay a few Bushes, Furze, or such like over them, and scatter a little Straw only to break the force of the winds, which in the Winter season injure more than Snow or Frost.

But for the *Cypress*, *Phillyrea*, and such other tender Winter-greens, you must defend them with more care.

Sowing of
a Coppice.

If you intend to raise a Coppice from Mast or Seed, dig or plough the parcel of ground you intend, as you would prepare it for Corn, and with the Corn either in the Autumn or Spring, sow also good store of such Mast, Nuts, Seeds, Berries, &c. as you desire; then take off your crop of Corn, and lay it up for Wood; although that several sorts of your Seeds come up the first, yet will they receive but little injury by treading at the Harvest, but injure it as little as you can: also the stubble being left high, will be a shelter for the young Trees the first Winter.

S E C T. IX.

Of the Transplantation of Trees.

The time.

The best time for removing or transplanting of all Trees that shed their Leaf, is in October, or the beginning of November immediately after, or at the fall of the Leaf; but that time being omitted, you may transplant them till the Spring in open weather, and before they bud.

All Trees that shed not their Leaf annually, but are ever green, are to be removed in the Spring when the cold is over, for they spring not so soon in the year as the other; but some affirm the only time to be in August.

Cut not the
tops of some
Trees.

Such Trees that are pithy, as the *Asb*, *Sycamore*, *Lime-tree*, *Aspen*, and such like, cut not off their tops the first year of their remove, because the wet will be apt to perish the Plant; neither diminish the heads, nor many

many of the branches, nor Roots of the *Firs, Pines*, or other *Rosinaceous* Trees, for they are prone to spend their Gum, to the great injury, if not ruine of the Plant.

The same time and Method is to be observed in the transplanration, removal, or propagation of the Suckers, Cions, Slips, or Layers of the *Elm, Birch, Lime-tree, Horse-Chestnut*, and such other Trees that are usually produced of Suckers, Layers, Slips, &c. as you do in the removal of the young Seedlings of the other Trees.

Of such Trees that come of Slips, Suckers, &c.

Only that for the slipping or laying of such Branches of Trees that had not before taken any Root, the most proper time is in the top of the Spring, about the time that the Sap is newly risen, and the Tree ready to bud.

Time to Slip or Lay.

All Trees that are raised of *Pitchers* or *Sets*, as the *Poplar, Aspen, Abel, Alder, Withy, Salley, Osier, Willow, Elder*, and *Privet*, are to be Planted in *February* or *March*, before they are too forward.

The time for Aquatics.

Let your young Plants be removed rather into a better mould (though there is but a little about the Roots) then a worse: let as much Earth adhere to the Roots as you may, and leave as much of the Root on as you can, abating only the top Root, or downright Roots, and spread the other every way in the pits or holes made for that purpose, which ought to be made larger and deeper than the Plant at present requires, and filled up with loose Mould, that young Roots may the better spread to seek nourishment for the Tree.

Manner of transplanting.

Trees will not prosper well if removed out of a warm shelter into an open bleak air, being sensible of so great a change. I have known Trees decay that have not been removed, only other Trees that sheltered them from the cold taken away.

In Transplanting be sure to preserve the smallest Roots which gather the Sap; and in filling the Earth about the Tree, endeavour to keep them to a level with Earth between them, that they may not be irregularly placed; for the well-settling these Roots will conduce very much to the prosperity of the Tree.

It is good to plant it as shallow as might be, and not below the better part of the Earth into the Gravel, Clay, Sand, nor Water, &c. but rather advance the Earth about the Tree, than set the Tree too deep; be sure also not to set it deeper than it stood before.

Plant shallow

In the removal of such Trees that have arriv'd to any considerable bigness, it is very expedient to observe the coast and side of the stock, which way it stood before its removal; and with Chaulk or Oker may you mark the South-side of the Trees or Plants before you remove them, and place the same sides to the Coast they tended to before. This was the practice of the Antients, as appears by *Virgil*.

Observe the coast.

*Also Heavens Quarters on the Bark they score,
That they may coast it as it was before,
Which Southern heat sustain'd, which view'd the Pole;
Such strength hath custom in each tender Soul.*

This is not to be esteemed such a trifle as *Lawson*, and many other trifling Authors pretend. For it is most evident that the Sap doth naturally flow most on that side of the Tree that's next the Sun, and on that side doth the Tree more increase than on the other, and is evident in observing

-serving

erving the Pith to be nearer the *North* than the *South*-side of the Tree; But in such Trees that stand thick in a Nursery, or have long stood in the shade, where the Sun hath wrought little or nothing upon them, you may be less critical.

The distance. The *Oak*, *Pine*, and *Walnut-trees* bear spreading large branches, and require greater distances than any other; therefore the nearest should stand forty Foot.

The *Beech*, *Asb*, *Eugh*, *Fir*, *Chestnut*, &c. may stand somewhat nearer than the other.

The *Elm* and the *Hornbeam* will grow the nearest of any Trees: For the other, you may plant them at what distance the magnitude of the Tree, your occasions, or the nature of it requires. You may either Plant the Trees in a regular Order, as *Rapinus* advises.

*Whither you Plant young Sets, or Acorns sow,
Still Order keep; for so they best will grow.
Order to every Tree like vigour gives,
And room for the Aspiring Branches leaves.*

But this agrees not with every ones Fancy, for

*There are more ways than one to plant a Grove,
For some do best a rude confusion love:
Some into even Squares dispose their Trees,
Where ev'ry side does equal bounds possess.*

*Watering of
Trees.*

The watering of your Trees immediately upon their transplantation, very much conduceth to their prosperity, and setting the Earth about the Roots, unless in weather extream cold, and where the Plant is of a tender kind: Also the young Plants for the first year will require your aid in watering of them in a dry Spring.

Also if Trees have been carried far, the setting of the Roots in Water some certain time before you inter them, conduces much to their revival.

*Staking of
Trees.*

If the Trees be of any considerable height, they ought to be carefully defended, as well from the injurious Winds, as the frications of Beasts, by staking them, and with a wisp of Hay, or other soft Ligament to bind them to such stakes, not omitting to interpose a little Moss or Hay, &c. between the Tree and Stake, to preserve it from galling: if your Trees be in danger of Cattles injuries, then you ought to bind or set bushes about them to prevent rubbing.

*Planting of
Aquaticks.*

Planters in most places do strictly observe to cut the foot or ground-end of *Poplar*, *Withy*, or other *Aquatick Pitchers* or *Sets*, only one way, like a Hindes foot, pretending that to be a principal observation.

*Removing
Trees in
Summer.*

If either your impatient Fancy, or your urgent occasions oblige you to the removal or transplantation of Trees in the Summer; you may tread in the steps of a certain *Prince Elector*, that at *Heydelberg* in the midst of Summer removed very great *Lime-trees* out of one of his Forests, to a steep Hill, exceedingly exposed to the heat of the Sun, the Heads being cut off, and the Pits into which they were transplanted filled with a Composition of Earth and Cow-dung, which was exceedingly beaten, and so diluted with Water, as it became almost a liquid Pap, wherein he plunged the Roots, covering the Surface with the Turf: It is presumed that if the Trees were smaller, be they of what Wood soever, there needeth not so absolute a decapitation.

Several

Several relations there are of Trees that have been planted or removed of eighty years growth, and fifty foot high to the nearest Bough, waisted upon *Floats* and *Engines* four long miles, with admirable success, and of Oaks planted as big as twelve Oxen could draw; to which effect, these are prescribed, as the ways to accomplish the like designs. Transplanting of great Trees.

Chuse a Tree as big as your *Thigh*, remove the *Earth* from about him, cut through all the *Collateral* Roots, till with a competent strength you can inforce him upon one side, so as to come with your *Axe* at the *Tap-Root*; cut that off, redress your Tree, and so let it stand covered about with the mould you loosened from it, till the next year or longer, if you think good; then take it up at a fit season.

Or a little before the hardest Frost surprize you, make a square Trench about your Tree, at such a distance from the stem as you should judge sufficient for the Root; dig this of competent depth so as almost quite to undermine it, by placing blocks and quarters of Wood to sustain the Earth; this done, cast on it as much Water as may sufficiently wet it, unless the ground were moist before; thus let it stand till some very hard Frost do bind it firmly to the Roots, and then convey it to the pit prepared for its new station.

But if it be over-ponderous, you may raise it with a Pully between a Triangle, placing the Cords under the Roots of the Tree; set it on a *Trundle* or *Sted* to be conveyed and replanted where you please: by these means you may transplant trees of a large stature, and many times without topping or diminution of the head; which is of great importance to supply a defect, and remove a Curiosity.

After you have transplanted your Trees, if you lay about the Roots or *Stems*, *Fern*, *Straw*, *Stubble*, *Hawm*, or any other Vegetable whatsoever, either green or half rotten is best, which will preserve the Roots moist in the Summer, and yield a good Manure or Soil, which the Rain will carry to the Roots. Helps to Trees.

Also stones laid about the Roots of Trees preserve them moist in the Summer, and warm in the Winter, and keeps them fast against the shaking Winds.

Copses may also be planted about *Autumn* with the young Sets or Plants, Planting of Copses. the best way is in rows about ten or fifteen foot distance, for then you may reap the benefit of *Intervals*, by Ploughing, or Digging, and Sowing, till the Trees are well advanced; Carts may also the better pass between at the time of felling without injury to the *Stems*, or danger of the Cattle; There will also be many pleasant Walks, and yet an equal burthen of Wood at the full growth of the Cope, as though they were thick, and confusedly planted.

There is a compendious way for thickning of Copses that are too thin, Thickning of Copses. by laying of some of the Branches of the Trees (that stand nearest unto the bare places) on the ground, or a little in the ground, giving it a chop near the foot the better to make it yield: this detained with a hook or two, and covered with some fresh mould at a competent depth, will produce a world of Suckers, and thicken and furnish a Cope speedily.

SECT. X.

*Of the Pruning, Shrowding, Cutting, and Felling of Trees and Copses.**Pruning of Trees.*

In the discreet performance of this work, the Improvement of our Timber and Woods doth much consist; and renders our Avenues, Walks, Parks, &c. much more pleasant and commodious to have the Trees stand in order, their Branches at a convenient height, and kept clean from all superfluities.

Such Trees that are for Timber, it's best to prune whilst they are young, and the Branches not too big; of these and other Trees it's good to cut off the Branches that are superfluous, about *January*, with a sharp Bill or other Tool, making the stroke upward by reason of the grain of the Wood, and to prevent the flitting of the Tree at the fall of the Branch, and cut it clean, smooth, and close: for by cutting of the Branches at a distance from the Tree, the stumps rot, and leave hollow holes which decay the Tree, and spoil the Timber.

Shrowding or Lopping of Trees.

Such Trees that are not fit for Timber, or that you desire should yield you a present advantage, or serve for Fuel, you may shroud or lop them, which will return you a considerable advantage, and is much to be preferred before a Copse in these several respects. 1. These Pollard or Shrowded Trees need no Fence to be maintained about them, standing in no danger of the browfings or Frictions of Cattle, Conies, &c. 2. You have the benefit of Grazing under these Trees, which is very considerable whilst the tops are young. 3. The stocks taken in time before they decay or grow hollow, yield a good Timber fit for many uses, or at least good cleft for the Fire. 4. And lastly, you may raise these *Pollards* in Hedge-rows, and spare places, and borders of your grounds, where they prove a good shelter as we before noted, and little injure the ground.

Notwithstanding the Copse is quicker of growth, and raises a more considerable advantage for the present than this way, in some places, therefore where you have conveniences for a Copse, I leave you to your election.

Times for Shrowding.

Trees are not to be shrowded till they have taken fast rooting, and so stood for three or four years, at what height you think convenient, so it be out of the reach of the Cattle, either at the beginning of the Spring, or the end of the Fall. For the harder sorts of Woods it is very indifferent, observing that they be not lopped above once in ten or twelve years, and at any time in the Winter. The Elm and the Ash, and such-like pithy and softer Woods are fittest to be shrowded at the Spring, lest the Winter injure the Tree.

Observations in Shrowding.

Always observe to cut the remaining stumps aslope, and smooth, that they cast the Water off, that the Tree perish not.

Take not off the head of the Poplar, nor any of the soft Woods (before unshrowded) growing upright, and smooth, after they have attained the bigness of ones Leg, unless you leave some Collateral shoots to attract the Sap; for it will endanger the Tree.

All *Perennial Greens*, or Resinous Plants, are not to be pruned or cut until the greater Frosts and bitter Winds are past, and then not in any wise decapitate the Fir, Pine, nor such pithy Plants, and be very sparing of their Collateral Branches. Pruning of Winter-Greens.

You may cut Aquatick Trees every third or fourth year, and some more frequently according as the Tree is in proof, or the shrowds or tops fit for your occasions; cut them not too near the main stock, because of perishing the Tree; and besides, it gives leave for the new sprouts. Cutting of Aquaticks.

The best time for cutting the Aquaticks, either to dress or plant them, is about the beginning of *March*, or the first open weather at the Spring; but if for the Fire, in the Winter before the Sap begins to rise, or you may cut them at any time between Leaf and Leaf. The Time.

Such *Copses* or *Copse-trees* that you have lately planted at one, two, or rather three years growth, may be cut within two or three Inches of the ground, in the Spring-time (the less prosperous especially) which the new Cions will suddenly repair in clusters, and tufts of fair Poles. Cutting of young Copses.

Copses being of a competent growth, as of twelve or fifteen years, are esteemed fit for the Axe: but those of twenty years standing are better, and far advance the price: seventeen years growth affords a tolerable Fell: you are to spare as many likely Trees for Timber, as with discretion you can. Felling of Copses.

The growth of Copses is so various according to the nature of the Ground, some being dry and barren, some moist and fruitful, that no time can be set but as the Copses are quick or slow in growth, and the bigness of the Wood suits with the Market, or your occasions, so may your discretion be guided.

Copses may be felled or cut from mid-*September* to mid-*March*, and to be avoided by mid-*May* at the farthest, else much injury may be done by Teams in bruising the young Cions, and injuring them with their feet; also the removing of the *Rough* or *Brush*, break off many a tender Sprig. The Time.

Cut not above half a foot from the ground, and that slope-wise, trimming up such as you spare for Standards, as you go from their extravagant Branches, Water-boughs, &c. that hinder the growth of others. Manner.

After the felling and removing of the Wood shut up all the Gaps about the Copse, having received a sufficient Hedge about the same before the Spring, and so keep it fenced and defended from Cattle, till it be above their reach; then about *July* may put in your Reeds to spend the Herbage in such well-grown Copses.

If your Copses have been neglected, so that they have been bruised by Cattle, and kept under that they are not apt to thrive, the best way is at felling-time, to new cut them, and preserve them better from Cattle, and they will soon be reduced to a better state than before, and thrive beyond expectation.

When your Timber-Trees are arrived to their perfect age, full growth, or best state (for at such a time it cannot be esteemed ill-husbandry to take them away, so that you be carefull to preserve others in their stead, though not in their places) or that you are necessitated to fell them, then consider which way, and what time is best for your advantage. Felling of Timber-trees.

*Te fell those Trees can be no loss at all,
Whose age and sickness would your Ax forestall
A youthful Successor, with better grace,
And plenty, will supply the vacant place.*

Time.

The time of the year is to be considered of according to the occasions or uses you have for your Timber; if it be for sale, and that your present advantage only you seek, then the best time to fell Oak is from mid-April to Mid-summer, the Sap being then proud, and the Bark is easy to be taken off, which will yield you a considerable price; But all other Timber whilst the Sap is down in the Winter-season. The reason is because the Sap is apt to breed the Worm; and the same Rule may be observed in all other Trees as well as Timber.

If you desire your Oaken-Timber for your own proper occasions, fell it in December or January, when the Tree is clearest of Sap, by which means the Timber will not be so much subject to the Worm, neither will it cast, rift, or twine, as it will if cut in the Summer: It will also last longer in any Buildings, and not be so apt to yield under a Burden: for the great plenty of Sap mollifies the Timber, and makes it rot and decay: therefore the cutting of Trees at Barking time, doth very much injure our Timber, debilitates our Edifices, and expedites their approaching decay.

Fell not in the increase nor full of the Moon, nor in Windy-weather, at least in great Winds, lest it throw the Tree before you are willing. I have seen a good Tree much injured by falling too soon.

*Manner of
felling great
Trees.*

For the Felling of the greater sort of Timber-trees, one of the first and most principal things is, the skilful disbranching of the Boal of all such Arms and Limbs as may endanger it in the fall; for many excellent Trees have been utterly spoiled for want only of this consideration: In the greater Arms chop a nick under it close to the Boal, and meet it with the down-right stroke, it will be cut without splitting.

If you reserve the roots in the Earth in expectation of a new encrease of Suckers; then fell the Tree as near the Earth as you can, for that is the best timber: But if you intend a total extirpation, then grub the Tree, which is more for your advantage: some advise to Bark the Trees as they stand, and the next season to fell them; which I take to be worthy of your practise.

CHAP. VII.

Of Fruit-Trees.

S E C T. I.

Of the Profits and Pleasures of Fruit-Trees.

THE planting of Fruit-Trees is undoubtedly one of the greatest improvements that can be made of the most part of our English Land, as all who have written of Improvements do agree; and *Worcestershire, Herefordshire, Gloucestershire, Kent*, and many other particular places in this Kingdom can sufficiently evidence the truth thereof.

1. Because it is more universal than other sorts of Improvements, there being but little ground in *England*, but one sort of Fruit or another will prosper upon it, if judicially prosecuted.

The charge of planting or raising most sort of Fruit-trees being so small, and the pains so easie, that the most slothful hath not any rational objection against it; but the most common is, that the poorer sort of people will rob and spoil the Plantations, &c. If you plant but a few, this objection may have place; but if you plant any considerable number, it will be worth while to attend them at that season, which is but short, when they are palatable; or to plant such that are not very inviting, and yet as profitable to the Planter as the most pleasant.

And when they become more common, they will be little regarded by these Filchers; or if they do borrow a few sometimes in their Pockets, or to make a few Apple-pies withal, yet that is a poor discouragement to an ingenious Spirit; and much like that Rustick Humour of one that would not improve a very good piece of ground for that purpose with Fruit-trees, because the Parson would have the decimation of it; and so denied himself the nine parts, because the Parson should not have the Tenth; which indeed is a grand impediment to improvement: & it is to be wish'd that there were some more certain *Modum* in lieu of that troublesome way of Tything.

This way of Improving by planting of Fruit-trees is more practised within these few years than hath been in Ages before; a sufficient Argument of the benefit the Country-man receives by it. The computation may be taken from the product of the young Trees, especially of Syder-fruit that our Nurseries have annually yielded throughout the greatest part of this Kingdom.

2. The use of Fruits is also universal both for meat and drink: That there cannot be an over-stocking of the Country with them, especially of Syder-fruits. This drink being more universally celebrated than any

any other, as the most pleasant (being of good Fruits, and rightly prepared) the most healthy, and most durable of any other, and must necessarily bring a very considerable advantage to the whole Kingdom in general, because a far greater quantity of Syder is usually produced out of an Acre of Land in one year, than can be made of the Barly growing on an Acre, and much less cost and trouble in the preparation; so that if but a small part of every Farm were planted for Syder, much of the Barly-Land might be converted to other uses, which in the end would be a National Improvement and Advantage.

It will also lessen that vast consumption we make of French-Wines, which we drink to the enriching of a Foreigner, the impoverishing of our selves, and the great prejudice of our healths, especially by the corroding Claret, and stummed White-Wines, when we have a thousand Testimonies that English Syder is to be preferred before any French-Wines, and known to be more Homogeneous to our Natures.

Mr. *Hartlib* in his Legacy tells you of the benefits of Orchard fruits, that they afford curious Walks for pleasure, food for Cattle in the Spring, Summer, and Winter, (meaning under their shadow) Fuel for the fire, shade for the heat, Physick for the sick, refreshment for the sound, plenty of food for man, and that not of the worst, and drink also of the best; and all this without much labour, care, or cost.

The high Applauses, Dignities, Advantages, and variety of Pleasures and Contents in the planting and enjoyment of Fruit-trees, Mr. *Ralph Austen* hath very copiously and particularly set forth in his Treatise of Fruit-trees, to which for brevity sake I refer you, and shall only in this place give you a Catalogue of such Fruit-trees, as are for our advantage, with the several ways of propagating and ordering of them. And first of Standard-trees.

1. Of Apples.

Among which the Apple worthily deserves the preheminance, both for its universality of place, scarce a Country parish in England but in some part or other it will thrive; and also for its use, being both Meat and Drink, and generally esteemed by the most curious, as a pleasant Dish. It also exceeds all other English Fruits for the time we enjoy them; not a day in the year but they may be had, and not of the worst. There is a very great diversity of the Species of them; Mr. *Hartlib* speaks of one who had about two hundred sorts, or Species, and does verily believe there are near five hundred in this Island: The French-Gardiner reckons up eighty seven several sorts of choice kinds of them in that Country; I presume he computes not the common.

They are of different Natures; some are early ripe, some later; some are but for a time, others are long preserved: I have heard of Pippins that have been kept two or three years sound, only by care in gathering of them, and at the right season kept in a Room free from the common Annoyances of Heat and Cold, and hung by the Tails: some preserved for the Table, others for Syder; the best for the Table are the Jenitings the Harvey Apple, the Golden Pippin, Summer and Winter Pear-mains and Pippins, the *John* Apple, with many others. There is a sort of *Russeting*, with a fine rough Gold coloured skin, with some Warts on it, which I can give no other name than the *Aromatick Russeting*, knowing no other sort; which Fruit excels any other Apple I have seen or tasted, and is worthy to be placed, not only the Tree in the best of your Planta-

Plantations, but the Fruit at the best of your Brumal Repasts. The Tree may be had at Mr. George Ricket's, near Hodsdon; and at Mr. Ball's at Brainford, two of the best Planters in England. The best for Cider are the Red-Streak, the Jennet-Moyl, Eleot, Stocking Apple, and some others.

Apples planted dispersedly about your Ground, either in the Hedges, ^{Profits of Apples.} or in Rows by the Hedges, raise a very considerable advantage at a very easie Rate or Charge, and that only in nursing them up till they are freed from common Injuries: the great advantages accruing thereby, are evident to the Inhabitants of *Herefordshire*, *Glocestershire*, and several other places in *England*. I heard it certainly related in *Herefordshire* of a Tenant that bought the Living he then Rented, only with the benefit he made of the Fruit growing thereon in one year; with this advantage, that he utter'd his Cider by Retail, as they usually do Beer. Orchards planted with Apples arise to a very considerable improvement: I know (saith Mr. Hartlip) that ten, or fifteen pound an Acre hath been ^{Legacy.} given for Cherries, more for Pears and Apples; the Land it self, whilst these Trees are small, and yield you not your desired gain, is capable of bearing any sort of Tillage, till the Trees yield too much shadow; and then, if they are not too thick, the Land is better than before it was planted, sometimes to a three-fold improvement, and hath the Preheminency above other Pastures in being Earlier, not subject to scorching heats; and in the Winter there is plenty of Food for Sheep, Calves, &c.

Next unto Apples, the Pear challengeth his place: They will prosper ^{2. of Pears} in some sorts of Land where Apples will not, as in Stony, Hungry, Gravelly Land; yea in a tough binding hungry Clay, the Root of a Pear-tree being it seems more able to pierce a stony and stiff Ground.

The Pear-tree bears almost its weight of Sprightful Windy Liquor; sometimes one Tree bears two, three, or four Hogsheads *per Annum*. In *Herefordshire* I was credibly informed, that near *Ross* groweth a Pear-tree of that Magnitude, that the Circumference of the Body, or Stem of the Tree, was as much as three Men from hand to hand, could beclip or fathom; and that there was made in one year of the Fruit thereof seven Hogsheads of Perry.

There are supposed to be four or five hundred several kinds of Pears, the French Gardener reckons about three hundred of choice sorts of Pears.

Several are for the Table; as the Winsor-Pear, Burgamets, Boon-Christiens, Green-field Pear, &c. For Perry, the Horse-Pear, both White and Red, the Bosbury-Pear. Choak-Pear, &c. It is worthy to be taken notice of that the best Pear for Perry, and so of Apples for Cider, are not very pleasant, Crude as they are from the Trees, and may be planted in the Fields or Pastures with less danger of loss than the Table-Fruit.

Some of these also are for the Summer only, and will not last; others will keep over the Winter.

The advantage of the Pear are equal to those of the Apples; for though they are deficient in some cases, yet they recompence it in other. It is the goodlier Tree in a Grove, to shelter a House and Walk from Summers heat, and the Winters cold winds, and far more lasting; and for the quantity of Ground it covers, bears much more than the Apple, because of their height.

Of

3. Of Cherries. Of Cherries there are several sorts; some of one colour, some of another; some early, and some late: but for the Orchard or Field, the *Flanders Cherry* excels. The Great bearing Cherry also is a very good kind, for he seldom fails; though in a cold and sharp Spring they are late ripe, and hang near a fortnight after they are Red, before they be through ripe: they are the fittest sort for the coldest places; they are not so pleasant as the other, by reason of the Tartness of Juyce; yet sharp Cherries are more wholesome than the sweet.

Legum.

The advantages of a Cherry Orchard are very great: Mr. Hartlip gives the Relation of a Cherry Orchard about *Sittenburn* in *Kent*, of thirty Acres, that produced in one Year above a thousand pound: That President might be but once; one Swallow makes not a Summer; yet they are usually worth Ten or Fifteen pound *per Acre*.

They are a Fruit that keep not long: therefore if your store exceed your Market, a most excellent Wine is made of them, by those that delight in such Liquors, which indeed are to be preferred before Foreign.

4. Of Wall-nuts.
mus.
Sylvia.

Wall-nuts not without desert, challenge a principal place in our Rural Plantations; the Tree groweth tall, is a great defence against Winds, a most excellent Ornament, delights in a dry, sound, and rich Land, if it Incline to a feeding Chalk or Marl; also in stony grounds, and of Hills, especially Chalky; likewise in Corn-Fields. In several places in *Germany* no young Farmer is permitted to Marry a Wife till he bring proof that he hath planted, and is a father of such a stated number of Wallnut-Trees. The Fruit will yearly sufficiently recompense the loss of the ground in drops, with a good advantage; the Timber bears a good price, and is of excellent use in every place, strong, and not subject to the Worm: but it is not to be entertained in Hedge-rows, no Tree thriving under its drip.

Stately Avenues and large Plantations are of them in *Surry*, to the very great advantage and recompence of the industry of the owners.

That which is produced of the thick shell of the Nut, becomes the best Timber; that of the thinner, the better Fruit.

If the Market should happen to be over-stocked of this Fruit for the Table by over great Plantations, yet may a considerable advantage be raised by extracting an Oyl of the Kernel, as at this time they do in *Normandy*, which is their principal use they convert them to. The Oyl is excellent for the Limner for laying his white Colours; it's good for Lamps and many other uses.

5. Filberts.

These are a Fruit growing so low, that we generally look over them; they delight in a fine mellow light ground, but will grow almost in any ground, especially if they are defended from the violent and cold Winds; The Tree is easily propagated, generally bears well, and yields a most excellent Fruit, not much inferior to the best and sweetest Almond. There are the White and Red, but the white is the best.

Being planted in rows near the greater Trees, they will bear under the shadow of them, and give you a good reward for your Industry. They delight in shady places, where few other Fruits will prosper.

They are a Fruit that may be kept long in the Husk, or in Sand.

6. Of Quinces.

Quinces are a very good Fruit; the Tree delights in moist ground, and near the Waters-side; and where they like their ground, they yield a very great increase; it is good to apply hot and rich Soils to the Roots of them,

them, which will be fully repaid in the Fruit. There are several kinds of them, some are a small Crab-Quince; others a fair, large kind of Quince: 'Tis good to plant of the best sort, and the best Bearers; the Portugal Quince is judged to be the best both for Bearing and use.

Mr. Hartlip tells you of a Gentleman at Prichel in Essex, who had a Tree from beyond Sea, that had the best in England, and had made above thirty pound of a small piece of Ground planted with them.

They are difficult to propagate; they will grow in any reasonable good Land: The Fruit is made use of several ways, some make a Drink or Wine of them, it's very good to colour Wine or Sider; but the greatest and most principal benefit and use of the Mulberry-tree, is the Leaf, being the only known food for the Silk-worm; if the Trees were more increased, it would be encouragement sufficient to keep these curious Creatures: although many have kept them, and made great quantities of the Silk, yet the difficulty of obtaining the Leaves, and where they are, they grow in Gardens generally, few in quantity, and valued according to the Ground they grow on, that it's a great discouragement to that noble Improvement.

If King James's Letter for the Planting of Mulberry-trees were again revived, or some compulsive Statute to that purpose, and diligently prosecuted, it would produce in time a very considerable advantage to this Kingdom.

Or rather, if His Majesty, or some Honourable Person, would allot some large parcel of Land, out of some Forrest or Chase, to be wholly Cultivated for the raising of a Mulberry-wood, it would become a most noble President for others to imitate: for the principal advantage must be raised on such Land not yet improved to the highest value by other Plantations, as usually Gardens are.

There are many kinds of Plums, and very much differing from each other. The better sorts, as the Mistle Plum, the Damazine, Violet, & Premorden-Plums, with many others, are very pleasant to be eaten, & require a very good rich warm Soil and place: The common ordinary Plumbs will grow almost any where, they are not worth the Planting to be eaten, unless you can find a way to make a good Wine out of them; doubtless they yield store of Spirits or Aqua-vite.

They are the more to be regarded, for that they thrive very well in shady places, where, except the Filbert and the Currant, scarce any other Fruit will prosper.

The Damzin is one of the best, wholesomest, and most profitable of Plums, and deserves a place in your Plantation: Mr. Hartlip gives it as a deficiency, that the great Damazine or Pruin-Plum is neglected, which groweth well, and beareth full in England.

Plum-trees and Damazines may also be planted in Hedges, being ordinarily thorny-Plants; they will thrive there better than Apples or Pears.

The Medlar is a Fruit of very little use, the reason I suppose they are no more multiplied, yet have they been of long standing; they are pleasing to the Palate: This Tree may serve to fill up a spare corner in your Orchard.

If we could obtain the Medlars without Sotnes, mentioned in the French Gardiner, they would be better worth the Planting. The great Dutch Medlar is the best.

10 Of Bar-
beries.

The Barbery is a common Plant in Orchards, and bears a Fruit very usefull in Housewivery: There are several sorts of them, although but one only common, above which is to be preferred that which beareth its Fruit without stones: There is also another sort, and chiefly differs from the common kind, in that the Berries are twice as big, and more excellent to Preserve.

11 Of Al-
monds.
Legacy.

Mr. *Hartlib* condemns us much for neglecting the propagation of this Tree, which (saith he) groweth well, and beareth good Fruit, as he hath seen divers bushels on a Tree in his Brothers Orchard; they grow large and upright, and need not the help of a Wall; the Almond is in some sweet, in others a little bitter. The Tree is chiefly received for the beauty of its Flowers, which being many, early, and of a fair, pale, reddish colour, make a fine shew in a Garden.

12 Of the
Service-Tree.

The common Service-tree grows wild in many places: but there is a kind thereof more rare; which by long standing grows to a fair Tree, with many branches set with winged leaves, like those of the Ash; but smaller, and indented about the edges: the Flowers grow in clusters, succeeded by Fruits; in some round, in others Pear-fashion, much bigger and better tasted than those of the common kind.

13 Of Goos-
berries.

There are many sorts and colours of Goosberries; the *White-Holland*, or *Dutch* Goosbery is the fairest, and best bearer of all others: the Berries are large, round, smooth, white, transparent, and well tasted. There is a sort of Green Goosberry that is also a very pleasant Fruit.

It's not a small advantage that's yearly reaped by this Fruit, the Tree propagated with so much facility, and yields a wonderful increase; and from the beginning of *May* to the middle of *July* contains a useful Berry.

This Tree beareth so great plenty of Berries, and is so easily propagated, that it may be supposed the Market, especially remote from *London*, may be over-stocked: but this Fruit taken in it's right time, yields so delicate a Wine, that you cannot solace your self with a finer Summer Repast.

Goosberries being through ripe, tast the most like Grapes of any of our English Fruits; and in case they are thoroughly pressed with an addition of Water, and well fermented, will yield in distilling, the best Brandy of any other of our Fruits, and very near as good as the best French Brandy.

14 Of Curr-
ants.

There are also several sorts and colours of this Fruit; the White is very pleasant, but the great Red exceeds all the rest, is a plentiful Bearer, and yields the largest Fruit.

The same may be said of the Currant, as before was of the Goosberry, it being also easily propagated, and a great Bearer, and yields a very pleasant Liquor; to be compared, being rightly ordered, with French-Wines.

But the best use this Fruit can be put unto, is, with the Juice hereof, and an equal quantity of Water to make Vinegar.

15 Of Rasber-
ries.

Rasberries are not to be omitted out of the number of the most pleasant and useful Fruits, which yield one of the most pleasant juyces of any Fruit; and being extracted and preserved, will serve to tinge any other Liquor with its delicate Aromatick Gust.

S E C T. II.

Of Wall-Trees.

Having given you a taste of the most usual Fruits growing in the Fields, Orchards, or Gardens, on Standards that necessarily depend not on any other Prop or Stay, I will now give you a List of such that are usually planted against Houses, Walls, Pales, or other supports; not only to preserve them from the violent Percussions of the weather, but to augment the heat of the Sun, for the sooner & better Maturing their Fruit; amongst which the Vine claims the precedency, being esteemed by ancient Philosophers the King of this Vegetable Kingdom: as Man is of the Animal, and Gold of the Mineral; most Countreys of the World enjoying the delicious Fruits of this most excellent Plant: it is esteemed a great deficiency, that they are no more propagated in this Island than they are; many are of opinion they will prove well, being planted in Vineyards, as they do in *France*, and give many instances of Vineyards that have formerly been in *England*, divers places yet retaining the name of Vineyards; as in *Bromwel-Abby* in *Norfolk*, and at *Ely* in *Cambridgeshire*, which afforded Wine, as these Rimes seem to testify.

Of the Vine.

Hartlib's Legacy.

Treatise of Fruit Trees.

*Quatuor sunt Elie, Lanterna Capella Maria,
Et Molendinum, necnon dans Vineæ Vinum.*

There are many places in *Kent* called by the names of Vineyards: the same likewise in *Glostershire*; between *Gloucester* and *Ross*, is a place containing the name of a Vineyard, as I was credibly informed travelling that way.

Hartlib's Legacy.

There are at this day several Presidents of making Wine in *England*; Mr *Hartlib* gives an instance of one at *Great Chart* in the *Wilde* of *Kent*, that yearly made six or eight Hogheads, which was much commended by divers that tasted of it, and had kept of it two years; and also of a Gentlewoman that pressed her Grapes, and expecting *Verjuice*, drew Wine.

Without question our Grapes will afford good Wine, if we can find places enough to bring them to such a Maturity, as some years they do on the House-sides and Walls, which hath been often attempted: but I cannot understand that they annually succeed, according to expectation; neither indeed do they on the Houses or Walls. The like inconveniences, though it's probable not in so great a measure, are the Vineyards in other the Northern parts of *France* and *Germany* subject unto; which methinks should not prove so great a discouragement, seeing that Hops, Apples, Cherries, &c. are also subject unto the same disappointments. But if they can be Cultivated, and raised to that state, as to bear well, and ripen well in seasonable Summers, we may the better dispence with such casualties, as in this, as other meaner Productions.

The places most commodious for this use and purpose, and most free from those annual casualties or inconveniences, must be so situated and defended, either Naturally or Artificially, as to be free from the continual Assaults of the Winds; for any Wind in the Summer Refrigerates, and impedes the Maturity of the Grape, and ought also to decline towards the South; if it doth not naturally decline

enough,

enough, it ought to be so laid by Art that its elevation may be as near as you can equal to the Elevation of the Pole, or somewhat less; that it may lye square to the Sun-beams, for the most part of the time the Sun passeth through the six Northerly Signs. The Banks or Borders so laid, ought also to be made circular (not streight) as though they contained about the eighth part of a Circle, the Center being in the South, like the Concave of the Burning-Glass which burns by Reflection; for by this means it doth as it were imbrace and detain the heat received from the Sun-beams, and breaks the Winds: for I have known the fairest, best, and most early ripe Grape, to grow on the side of a House after the afore-said manner cited, when on the same Tree, and on another part of the house, although it received as much of the Sun, they were not so good, nor early, by reason they lay more in the wind, and the Sun-beams less direct.

There are several other things also to be considered of, to accelerate the Maturity of this most excellent Fruit, as the warmth, richness, and lightness of the Soil, which may be much advanced by Art, in applying several Ingredients suitable to that purpose; also by covering the surface of the Ground with Tiles, Sand, or such like, that may keep down the Weeds, and afford some assistant heat. The Land that is most apt to produce the largest Brambles, is said to be the most Natural to the Vine, and the fittest to plant a Vineyard on.

It hath also been the usual practice to deprive the Vine of its leaves in the Summer, under pretence of laying the Grape more open to the Sun; but that hath proved, rather than a help, an impediment to the Maturity of them, by depriving them of their shelter from the cool Airs, which in most Summers are more than the scorching heats; as I have often observed the best Grapes, and earliest ripe, to be under the shadow and protection of some Leaf. For what I have here said, and for what else is necessary towards the propagating of this Noble Plant, I must submit to the judgment and experience of such Persons worthy of Honour, that have made far deeper Essays than I have done, and are better capacitated by Reason, Judgment, and Experience, to further and advance their Design.

The choice of Grapes also is very necessary: Mr. *Hartlib* commends the Parsly-Grape, the Rhenish-Grape, the Paris-Grape, and the small Muskadel, as most suitable to our Climate; but the Currant-Grape, or Cluster-Grape is both the earliest and sweetest of Grapes, although the Clusters are but small.

But if our Country-man be not minded, or have not conveniencies for the raising of a Vineyard, yet may it prove a very considerable advantage to plant Vines on the South-East, and West sides of his Houses, Barns and Walls; and by good Culture and Pruning, they will yield a very considerable increase. I have known several Bushels of Grapes grow on one Vine, being well Pruned, when the same Vine neglected, hath yielded very few, and those not so good as when there were many.

Although the Wine that is produced of our English Grapes, be not so excellent as that which is produced of other Fruits, yet to be converted to Vinegar, may prove a very great advantage, that yielding no mean price, the right way of making it being not difficult, the same Method being ordinarily used for converting Elder into Vinegar, which may to better advantage be done with sharp Wines.

Apricocks are very well known, almost every where; there are several kinds of them, some earlier, and some larger than the other: although the Tree will grow very well as a Standard, yet it seldom brings its Fruit to maturity, unless it hath the benefit of some Wall or Pale. 2 of *Apricocks*

This Tree flourishes much in a light, free, and rich Soil, but spends it self too much in Branch, and but little in Fruit; besides it is subject to the Canker: Wherefore to correct that Vice in the Mould, the best way will be to dig a large Pit where you intend to plant your Tree, and fill it above a Foot thick, and within a Foot or 18 Inches of the Surface, with Chaulk, Marle, or other white Earth if you can obtain it; by which means the tree is prevented from rooting too deep, or drawing too much of that luscious Sap; and so thereby may the Tree be more fertile, the Roots also lying warmer and nearer the Sun and Air: for it is observed, that in white Lands this Tree is found, spends but little in Branch, and bears plentifully; and in the rich black Mould it runs out in Branch, is subject to the Canker, and bears but little.

There is lately a new Mode of planting these, and other sorts of Fruit, as Apples, Pears, Peaches, Grapes, &c. in Dwarf-trees; that is, they are kept under-hand, that they attain not to full three Foot in height; by which means, being under the Wind, and having the benefit of the reflecting heat of the Earth, they produce their Fruit Mature, and early.

Peaches, Nectarines, & Malcotones, are also to be planted against Walls, Houses, &c. and are of several sorts very much differing the one from the other; the best are best cheap. 3 of *Peaches*, &c.

Figs are to be planted against Walls; but being of so little use in our Rural Habitation, I shall leave them. 4 of *Figs*

Although *Currants* are generally planted as Standards, and in the Sun, yet there is no Tree admits of a greater Improvement against a Wall, and in the Shade, than this very Tree; it growing much larger, and spreading against a Wall to twelve or fourteen Foot high and broad, on the North-side of a House or Wall, and bearing most plentifully, large and delicate Fruit. 5 of *Currants*

There are some other Fruit-trees, as the *Lote-tree*, the *Virginia-Plum*, the *Cornel-tree*, and such like, that are of small use, advantage, or pleasure; which I leave to the freedom of every man to plant, or use as he pleaseth.

SECT. III.

Of the Propagation of Fruit-trees.

There are several ways of increasing or multiplying the fore-mentioned Fruit-trees; some by Grafting, some by Inoculation or Budding; some from the Seed, Nut, or Kernel; others by Layers, Slips, and Suckers, whereof more particularly; and first of Grafting.

This Art hath been for many ages, the most proper, speedy, and beneficial way to propagate several sorts of Fruits; although the same Fruits may be raised by Kernels, yet do they most usually prove wild, and in taste austere and sharp, tending rather to the wildness of the Stock on which the Tree (whereon the Fruit grew) was Grafted; & although they seem fair, yet they want the vivacity of Spirit, and are more woody

woody than the Grafted Fruit: they are also of a much longer continuance ere they bear, and are not then so fruitful. Sometimes Apples have proved well from the Kernel, and have proved much larger Trees, and have born greater burthens (when they have been many years old) but rather by accident, and at best not worth ones labour. Of other Fruits, as Plums, Cherries, Aprecocks, Peaches, &c. unless Grafted or Inoculated, are not of any value: therefore this Art and Custom of Grafting, or Inoculation, doth preserve the Species of our most dainty Fruits, and meliorate their Gusts, and affords us the most expeditious, pleasant, and advantageous way of gratifying our Senses, and fulfilling our desires in this most Innocent of Natural Practices.

1 By Grafting.

The Fruits that are to be Grafted, are the Apple, Pear, Cherry, Plum, and the Medlar; Filberds, Services, and Quinces may also be Grafted.

Stock to Graft on.

The first thing to be considered in Grafting is the Stock; according to the nature of the Tree you intend to raise, must your Stock be; for

For Apples.

Apples, the sower the Stock is, the better is the Fruit; therefore the Crab-stock is usually preferred; they will be more free from the Canker, will become large Trees, and last longer: The Fruits also will be better and harder on Crab, or sower Apple-stocks, than on sweet.

For Pears.

The best Stocks to Graft Pears on, are those raised from the Kernel, or the wild Pear-tree; the White thorn is not good.

For Cherries.

Cherries prove best Grafted on the Black-Cherry-stock, or the Merry-stock, which may be raised in great quantities from the Stone.

For Plums.

Plums are to be Grafted on Plum-stocks, and no other.

For Medlars.

Medlars may be Grafted on the Wite-thorn, but prove best on Pear-stocks.

For Filberds, and Services.

Filberds may be Grafted on the common Nut, and Services on their own kind.

For Quinces.

Quinces also may be Grafted on their own kind.

2 By Inoculation.

The Fruits that best succeed by Inoculation, are Aprecocks, Peaches, and Nectorines; Goosberries and Currants, Plums, Apples, Pears, and Cherries may be Inoculated with good success; and several other sorts of Fruits and Trees.

Aprecocks, &c.

Aprecocks, Peaches, and Nectorines, are usually Inoculated in Plum-stocks, raised either from Suckers or from Stones; those of the white Pear-Plum are esteemed the best; and those of any other great white or red Plum, that hath large Leaves and Shoots, are very good, either to Graft or Inoculate other choice Plums upon, or for the budding of Aprecocks and Peaches; but for a Nectorine, a Peach-stock is most proper. The Stones of Aprecocks and Peaches are not worth the setting, for Stocks to inoculate with other good kinds, in respect their Roots are spongy, and will neither last nor endure to be transplanted; therefore the Stones of Plums and Cherries are chiefly for that purpose to be regarded, except the Peach-stock for the Nectorine.

Goosberries, &c.

Goosberries and Currants are inoculated on their own kind; and so are Plums, Apples, Pears, and Cherries.

SECT.

SECT. IV.

Of the Nursery for Stocks.

For the obtaining of a sufficient number of Stocks to Graft and Inoculate the several sorts of Fruits you intend to propagate and advance, and also to pleasure your self with such that may be suitable for your intended purpose, and not to be enforced to rely on such that the Countrey spontaneously affords, either for quantity or quality, prepare a Bed of Earth well dressed from Weeds, proportionable to the Seeds or Stones you intend to sow, and therein sow your Kernels of Crabs, or such like Apples as you intend to raise your Stocks from, and cover them with Earth sifted or raked over them, two or three fingers thick. This may be done about *October* and so let lye till the Winter: For the Stones of Fruits you may prick them down in rows, two or three fingers deep, with the sharp end downwards; you may also cover them with long Dung, or Straw, to keep them from the violence of Frosts, which in *April* you may take off, and in *May* they will come up; and being kept from Weeds, in two years will be ready to remove into other Beds prepared for that purpose; whereof they are to be planted at a more convenient distance, and better order, for the benefit of the Plant, and conveniency of the Grafter.

In *Autumn* is the most convenient time for this purpose, though it may be done at any time in the Winter, or Spring before they bud: Let them be set in rows about two foot distance, or as best pleases your self, and the Plants in each row about six or eight Inches apart, for the better conveniency of transplanting them; make the holes with an ordinary Setting-stick, and cut off the downright Roots, and the Tops and Side-branches of the Plants, and fasten the Earth about them: Let not the Roots be too long nor set too deep, because they are afterward removed with more difficulty.

It is necessary to remove Seed-Plants, for by that means they get good Roots, which otherwise they generally thrust down one single Root only.

The Nursery thus set, may be ready after one year to Inoculate, and after two or three years to Graft.

Crab-stocks, or Apple-stocks thus raised, are better than those that come from the Woods, or any other ways.

Let the Kernels you raise your Nursery from, consist most, or altogether, of Crabs or Wildings of the Apple-Grafts.

Trees Grafted on a Gennet-Moyl or Cider-stock, preserve best the Gust of any delicate Apple; but on a Crab-stock the Tree lasts longer, and imparts a more juicy and tart relish, and so are to be preferred before most sorts of Apples: the wild Stock does enliven the dull and phlegmatick Apple, and the stock of a Gennet-Moyl sweetens and improves the Pippin, &c. or may rather seem to abate some Apple over-tart and severe. The same Rules may be observed in the choice of Stocks for Pears, Plums, Cherries, Aprecocks, &c. the more Acid the Stock, the more life it gives to the Fruit of the Graft; as the Black Cherry, or the Cherry-tree, is the only stock for the Cherry, &c.

Although

Although the Fruit doth generally take after the Graft, yet is it somewhat altered by the stock, either for the better or the worse: as Apples, or other Fruit Grafted on stocks select, as before, advance or meliorate them; so if they are grafted on stocks of another contrary nature, much debaseth the Gust of the Fruit.

The Pear Grafted on a Quince-stock, produceth its Fruit better than the same kind upon a wild Pear-stock, and fairer; much better coloured, and the Trees to bear sooner, and more store of Fruits; for the Fruit not only receives something of the Nature of the Stock, as well as the Graft, but also of the Soyl wherein they are planted, and of the Compost applied unto them.

Therefore chuse a plat of Ground for your Seminary and Nursery, that may be of an indifferent nature, not too much enriched with Dung, nor too Sterile, lying warm, the Mould light, that the Stocks may the better thrive: Also let your Stocks be of Fruit select, as before for that purpose.

If you desire to raise Dwarf-trees, let the Stocks whereon you Graft them, be of the *Paradise-Apple* for Apples, of the Quince for Pears, of the Morello, or common English Cherry, for Cherries; and so will they be the more fit for the Wall, or for standards, being kept low according to the new Mode, though I see but little pleasure or profit in that way.

The best way, & most expeditious to raise a great quantity of Quince-stocks for your Nursery, is to cut down an old Quince-tree in *March*, within two inches of the Ground, which will cause a multitude of Suckers to rise from the Root: When they are grown half a yard high, cover them at the bottom a Foot thick with good Earth, which in dry times must be watered; and as soon as they have put forth Roots, in Winter remove them into your Nursery, where in a year or two they will be ready to Graft with Pears.

Plum-stocks and Cherry-stocks may be raised from Suckers, as well as from Stones, having regard to the kinds whence they proceed.

S E C T. V.

Of the time and manner of Grafting.

Having thus prepared your Nursery, and raised a sufficient quantity of Stocks to Graft or Inoculate on, you must consider the several ways the several kinds of Fruits are to be propagated, and which are most suitable; and also the several times and seasons wherein to Graft, and wherein to Inoculate.

The time for Grafting.

The times to Graft, are most usually in *February* and *March*; but I have Grafted even unto mid-*April* some backward Fruits, and that with good success. You may begin also in *January*, especially with the more forward Fruits, as Plums, Cherries, such that have many to do, or much employment other way, may begin more early, lest they want time.

You may either Graft or Inoculate at any time of the year, except *October*, and *November*, saith *Stephens*, the Author of the *Countrey-Farmer*; but whether that may be practised with success in these colder Countries, I much question. But doubtless the temperature of the season doth

doth very much conduce to the growth or proof of the Graff, as mild weather in *December* or *January*, may be better for this work, than Frosty weather in *February*. Frosty weather at no time is fit to Graff in.

When the *Zephyres* of the Spring are stirring, chuse that season before all others for this work. Evelin's
Pomona.

Make choice of your Graffs from a constant and well bearing Branch, if conveniently you can; others may do very well. 2. Choice of
Graffs.

The Graffs of such Trees as are ill bearers; or not come to bear Fruit, are to be rejected, the Graffs always partaking of the quality of the Tree from whence they are taken.

Chuse not those that are very small and slender, they commonly fail; but take the fairest upon the Tree, and especially those that are fullest of Buds. Austin of
Fruit-trees.

In *Herefordshire* they do frequently chuse two Graffs of several years growth, and for the Graffing of such large stocks as are taken out of the Woods or Nurseries, and fitted into Rows: for Orchards they chuse not the Graffs so small as in other Countreys they require them.

Once for all, the stumpy Graff will be found much Superior to the slender one, and make a much Nobler and larger shoot. This upon experience.

Graffs of any kind being cut before they begin to spring, may be kept many days or weeks, and carryed many miles, being bound up in Moss, the ends stuck in Clay or Earth; or being wrapped in oiled or waxen Leather, or the ends stuck in a Turnep. 3. The keeping
of Graffs.

Many excellent Graffers assure us, that the Graff which seemed withered, and fit to be cast away, hath proved the best when tryed: That the Graff a little withered and thirsty, is better received of the Stock.

Having your Stocks and Graffs ready at the time convenient, together with your Tools, and other Materials, as the Pruning-knife, Pen-knife, or other small sharp knife to fit the Graffs withal, fine Saw, Mallet and Wedge, & also Rushes, or strong soft Flags, or woollen Yarn to bind the Graff and Stock together, and Clay well tempered with Horse-dung to keep the same from chopping in dry weather, or soft Wax for the smaller Trees, and a small Basket to carry the Graffs in, with such other Instruments and Materials as you shall judge necessary for your work and suitable to the method you intend to proceed in, or as your own Ingenuity shall direct, then may you proceed in some or one of these several ways of Graffing: *viz.* 4. Instruments
for Graffing.

Either first by Graffing in the Cleft, which is the most known and ancient way, and most used for the middle-sized Stocks; the manner thus: Graffing in
the Cleft. First saw off the head of the stock in a smooth place; for Wall-Trees or Dwarf-trees, within four fingers of the ground; for tall Standards higher, as you shall think convenient, or your Stock will give way: then pare away the roughness the Saw hath left on the head of the Stock; then cleave the head, (some advise a little beside the pith) and put therein the Wedge to keep the Cleft open; which cut smooth with the point of your small sharp knife, that the sides may be even: then cut the Graff on both sides, from some Knot or Bud, in form of a Wedge suitable to the Cleft with Should'rings; which Graff so cut, place exactly in the Cleft, that the inward Bark of the Cion may joyn to the inward part of the Bark or Rind of the Stock closely, wherein lies the most principal

principal skill and care of the Grafter, if he expects the success answerable to his labours or expectation; then draw out the wedge: but if the Stock pinch hard, lest it should endanger the dividing of the Rinde of the Graff from the Wood, to the utter spoiling of the Graff, let the inner side of the Graff that is within the wood of the Stock be left the thicker, that so the woody part of the Graff may bear the stress; or rather you might leave a small wedge in the Stock to keep it from pinching the Graff too hard, and then you may leave the outside of the Graff a little the thicker: which I have usually done, as in smaller Stocks which pinch but weakly. Herein also is required care and judgment; then cover the head of the Stock with the tempered Clay, or with soft Wax to preserve it, not only from the extremity of cold and drying Winds, but most principally from wet.

Grafting in
the Bark.

The second way of Grafting, and much like unto the former, is Grafting in the Bark or Rinde of the greater Stocks, and differs only in this; that where you cleave the Stocks, and fasten the Graffs within the Cleft in the other way, here you with a small wedge cut tapering downwards, to a point thin, like unto a half round File, and made of Ivory or Box, or other hard wood; only force in the same wedge between the Rinde and Stock, after the head thereof is sawn off, and the roughness pared away: then you are to take the Graff, and at the Shoulder or grossest part of it, cut it round with your small Grafting-knife, and take off the Rinde wholly downwards, preserving as much of the inner Rinde as you can; then cut the wood of the Graff about an Inch in length, and take away half thereof to the Pith, and the other half Taper it away, and set it in the place you made with your Wedge, between the Bark of the Stock and the Wood, that the shouldering of the Graff may joyn closely to the Bark or Rinde of the Stock; and then with Clay and Horse-dung cover it as you do the other.

This way is with most conveniency to be used when the Stock is too big to be cleft, and where the Bark is thick. Here you may also set in many Graffs in the same Stock, and with good success.

Also especial care is to be taken to keep the tops of your Stocks covered from time to time, till the Bark itself hath covered it, to prevent the Rains from rotting the Stock, yet (as Mr. Evelyn saith in his *Pomona*) it has been noted, that many old Trees quite decayed with an inward hollowness, have borne as full burdens, and constantly, as the very soundest, and the Fruit found to be more delicate than usually the same kind, from a perfect and more entire Stock.

Leave not your Graff above four, five, or at most six inches above the Stock; for being too long they draw more feebly, and are more exposed to the injuries of weather, and hurt by Birds, and prosper not so well; but herein regard is to be had to the greatness of the Stock, and its long continuance in the same place, and its ability to furnish the Graff with Sap sufficient.

Graft your Cions on that side of the Stock where it may receive the least hurt from the Southwest wind, it being the most common, and most violent that blows in Summer, so as the wind may blow it to the Stock, and not from it. Regard is here also to be had to the situation of the Nursery, you please to Graft in.

The

The third way of Grafting that is made use of, and to be performed somewhat later than the other, and seems to be of a later Invention, because it is not so generally taught and used as the former, is *Shoulder or Whip-grafting*, and may be done two ways. First, by cutting off the head of the Stock, and smooth it as in Cleft-grafting; then cut the Graft from a knot or Bud on one side, sloping about an Inch and a half long, with a shouldring but not deep, that it may rest on the top of the Stock. The Graft must be cut from the shouldring smooth and even, sloping by degrees, that the lower end be thin: place the Shoulder on the head of the Stock, and mark the length of the cut part of the Graft, and with your knife cut away so much of the Stock as the Graft did cover (but not any of the Wood of the Stock) place both together, that the cut parts of both may joyn, and the Saps unite the one in the other, and bind them close together, and defend them from the Rain with tempered Clay or Wax, as before. *First way.*

The other way of this Whip-grafting, is where the Grafts and Stocks are of an equal size, the Stock must be cut sloping upwards from the one side to the other, and the Graft after the same manner from the Shoulder downwards, that the Graft may exactly joyn with the Stock in every part; and so bind, and clay, or Wax them, as before. *The second way.*

These (especially the first way) of Whip-grafting are accounted the best. 1. Because you need not wait the growing of your Stocks; for Cleft-grafting requires greater Stocks than those ways. 2. This way injureth less the Stock and Graft than the other. 3. The wound is sooner healed, and thereby better defended from the injury of the weather, which the Cleft-stock is incident unto. 4. This way is more facile, both to be Learned and performed.

The fourth way of Grafting is by Approach or Ablatation; and this is performed later than the former ways, to wit, about the Month of April, according to the state of the Spring. It is to be done where the Stock you intend to Graft on, and the Tree from which you take your Graft stand so near together, that they may be conjoyned; then take the Sprig or Branch you intend to Graft, & pare away about three Inches in length of the Rinde and Wood near unto the very Pith; cut also the Stock or Branch on which you intend to Graft the same after the same manner, that they may evenly joyn each to other, and that the Saps may meet; and so bind them, and cover them with Clay or Wax, as before. *Grafting by Approach.*

As soon as you perceive the Graft and Stock to unite, and be incorporated together, cut off the head of the Stocks (hitherto left on) four Inches above the binding, and in March following, the remaining stub also, and the Cion or Graft underneath, and close to the Grafted place, that it may subsist by the stock only.

Some use to cut off the head of the Stock at first, and then joyn the Cion thereunto, after the manner of Shoulder-grafting, differing only in not severing the Cion from its own Stock: Both ways are good, but the first more successfull.

This manner of Grafting is principally used in such Plants that are not apt to take any other way; Oranges, Lemons, Pomegranates, Vines, Gessamins, *Althea frutex*, and such like. By this way also may attempts be made to Graft Trees of different kinds, one on the other, as Fruit-bearing Trees, on those that bear not, and Flower-trees on Fruit-

trees, and such like. I have also by this inverted the top of a Cion downwards into the Stock, which hath taken; and afterwards cut off the Graft three or four buds above the Stock, which grew, although but slowly, by means of the Sap being forced against its usual Current.

These are the most usual ways of Grafting: some other there are, but they differ so little from the former, and where they differ its rather for the worse; and therefore not worthy the mentioning.

Those Grafts that are bound, you must observe to unbind them towards *Midsummer*, lest the Band injures them.

Where their heads are so great that they are subject to the violence of the winds, it's good to preserve them, by tying a stick to the Stock, which may extend to the top of the Graft, to which you may bind the Graft. The first year the best thriving Grafts are most in danger; afterwards they rarely suffer by the Winds.

Grafts are also subject to be injured by Birds which may be prevented by binding some small bushes about the tops of the Stocks.

*A new way
of Grafting.*

There is another way of Grafting lately invented, which is by taking a Graft or Sprig of the Tree you design to propagate, and a small piece of the Root of another Tree of the same kind, or very near it, and Whip-graft them together, and bind them well, and plant this Tree where you intend it shall stand, or in a Nursery; which piece of Root will draw Sap, and feed the Graft, as doth the Stock after the other ways.

You must observe to unite the two But-ends of the Graft and Root, and that the rind of the Root joyn to the rind of the Graft.

By this means the Roots of one Crab-stock or Apple-stock will serve you for 20 or 30 Apple-Grafts; and in like manner of a Cherry or Merry-stock for as many Cherry-Grafts; and so of Pears, Plums, &c.

Thus may you also raise a Nursery of Fruit-trees instead of Stocks, by planting them there, where they are too small to be planted abroad, where they are subject to prejudice.

This way more than any other, is best for the raising of tender Trees that will hardly endure the Grafting in the Stock; for here they are not exposed to the injuries of Sun, Wind or Rain.

It is also probable that Fruits may be meliorated by Grafting them on Roots of a different kind, because they are more apt to take this way than any other.

The Trees thus Grafted will bear sooner, and be more easily Dwarfed than any other, because part of the very Graft is within the ground; which being taken off from a bearing sprig or branch, will Blossom and Bear suddenly, in case the Root be able to maintain it.

The only Objection against this way is this, that the young Trees grow slowly at the first, which is occasioned by the smallness of the Root that feeds the Graft; for in all Trees the Head must attend the increase of the Root from whence it hath its nourishment.

Nevertheless this work is easily performed, Roots being more plentiful than Stocks, and may be done in great quantities in a little time within doors, and then planted very easily, with a slender Dibble in your Nursery, and will in time infinitely recompence your pains.

S E C T. VI.

Of the Time and Manner of Inoculation.

Next unto Grafting, Inoculation takes place; by some preferred before any of the ways of grafting before treated of: It differs from the other ways in this; that its performed when the Sap is at the fullest in the Summer; and the other sorts of Grafting are before the Sap ascends, or at least in any great quantity. Also by this way of Inoculation may several sorts of delicate Fruits & Trees be propagated and meliorated, which by Grafting cannot be done, unless in the last way before mentioned. As the Aprecock, Peach, or Nectarine, rarely thrives any other way than this, because few Stocks can feed the Graft with Sap so early in the Spring as the Graft requires it, which makes it frustrate your expectation; but being rightly Inoculated in the fullness of the Sap, rarely fails.

The Stocks on which you are to Inoculate, are to be of the same kind, as before was directed to Graft on.

The Peach takes best on its own kind; but the Nectarine thrives not well, unless upon a Peach stock.

The time for this work is usually from *Midsummer* to the middle of *July*, when the Sap is most in the Stock. Some trees, and in some places, and in some years, you may Inoculate from mid-*May* to mid-*August*. As to the time of the day, it is best in the Evening of a fair day, in a dry season; for Rain falling on the Buds before they have taken will destroy most of them.

The Buds you intend to Inoculate must not be too young nor tender, but sufficiently grown: The Aprecock Buds are ready soonest; they must be taken from strong and well-grown shoots of the same year, and from the strongest and biggest end of the same shoots.

If Buds be not at hand, the stalks containing them may be carried many miles, and kept two or three days, being wrapt in fresh and moist Leaves and Grass to keep them cool. If you think they are a little withered, lay the stalks in cold water two or three hours; and that, if any thing, will revive them, and make them clean off the Stocks.

Having your Buds and Instruments ready for your work, viz. a sharp pointed Knife or Pen knife, a Quill cut half way, and made sharp and smooth at the end to divide the Bud and Rinde from the stalk; and Woollen Yarn or dry Rushes, Flags, or such like, to bind them withall: Then,

On some smooth part of the stock, either near or farther from the ground, according as you intend it, either for a Dwarf-tree, or for the Wall, or a tall Standard, cut the Rinde of the stock overthwart; and from the middle thereof, gently slit the Bark or Rinde, about an Inch long, in form of a T, not wounding the stock; then nimbly prepare the Bud, by cutting off the Leaf, and leave only the Tail about half an Inch from the But; then slit the Bark on each side the Bud, a little distance from the Bud, and take away the Bark above and below, leaving the Bark half an Inch above and below the Bud, and sharpen that end of the Bark below the Bud, like a Shield or Escutcheon, that it may the more easily go down, and unite between the Bark and the Stock: Then with your

¹ The time for Inoculation.

² The choice of Buds.

³ Instruments for Inoculation.

⁴ The manner of Inoculation.

your Quill take off the Bark and Bud dexterously, that you leave not the root behind; for if you see a hole under the Bud on the inside, the Root is gone, cast it away, and prepare another. When your Bud is ready, raise the Bark of the stock on each side in the slit (preserving as carefully as you can the inner thin Rinde of the Stock) put in with care the Shield or Bud between the Bark and Stock, thrusting it down until the top joyn to the cross cut; then bind it close with your Yarn, &c. but not the Bud it self.

Another way
to inoculate.

There is another way of Inoculation more ready than this, and more successfull, and differs from the former, only that the Bark is slit upwards from the cross cut, and the Shield or Bud put upwards, leaving the lower end longer than may serve; and when it is in its place, cut off that which is superfluous, and joyn the Bark of the Bud to the Bark of the Stock, and bind it as before; which sooner and more successfully takes than the other, as I my self have experienced.

Another way.

I have also cut the edges of the Bark about the Bud square, and have cut the Bark of the Stock fit to receive the same, and bound it fast; which succeeded well, and is the readier way, and more facile.

About three weeks or a months time after your Inoculation, you may unbind the Buds, lest the binding injure the Bud and Stock.

When you unbind them, you may discern which are good, and have taken, and which not; the good appear Verdant, and well coloured, the other appear dead and withered.

In March following cut off the Stock three fingers above the Bud; and the next year cut it close, that the Bud may cover the Stock, as Graffs usually do.

SECT. VII.

Of raising Fruit-trees by the Seeds, Stones, Nuts, or Kernels.

We have given you a short Survey of such Fruits as are propagated by Grafting and Inoculation, & the way or method of promoting the same. Now we are to touch upon some few Trees or Fruits that are raised from their own Seed or Kernel, as Almonds, Services, Walnuts, Filberds. Some others there are, as Oranges, Lemons, and such like not necessary for our Rural Theatre; therefore I shall say little to them.

Wal-nuts.

But the only known and beneficial way to propagate the Wallnut-tree, is from the Nut; which from the time of gathering of them you may keep, and preserve in beds of Sand or Earth till March; and then plant them, if you can, in the places where they are to abide; for so will they prosper exceedingly, and much more than any removed: but if you remove any, be cautious of cutting the Branches or Roots, lest you endanger the Tree.

Be careful to preserve the Nuts from Mice; for if they can come at them, you will have but few left. Although I planted some Hundreds in their Husks, and a great number of them wrapped in Clay, yet were all to a very few transplanted by the Mice.

Filberds

Filberds also may be raised from the Nut, and are easier obtained, and carried farther, than the Suckers or Plants of the same Tree, and are raised and ordered as Walnuts are. *Filberds.*

It's the best and most usual way also to raise Almond-trees from the stone, which must be set in the place they are to abide, not easily growing after a remove. *Almonds.*

Chestnuts and Services are also raised from the Fruit of them, by being sown in your Seminary, and thence removed. *Chestnuts and Services.*

SECT. VIII.

Of raising and propagating Fruit-trees by Layers.

Slips and Suckers.

There are also several sorts of Fruits that are to be raised with more advantage and facility from Layers, Slips or Suckers, than from Grafting, Inoculation, or from the Seed; and such are Codlings, Gennet-Moyls, Quinces, Filberds, Vines, Figs, Mulberries, Goosberries, Currants and Barberries.

The *Kentish* Codling is very easily propagated by Slips or Suckers, and is of so good a nature as to thrive, being set very near, that they make a very ornamental Hedge, which will bear plentifully, and make a most pleasant prospect; the Fruit whereof besides the ordinary way of Stewing, Baking, &c. being very early, makes a Delicate Cider for the first drinking. *Codlings.*

These Trees ought not to be ropt or plashed, as is usual, they growing tall and handsome, which if ropt decay, and grow stubby and unpleasant; neither do they bear so well.

The Gennet-Moyl-tree will be propagated by Slips or Cions, as is the Codling, but is not so apt to grow in a Hedge as the other: both of them bear sooner, if Grafted as other Apples are. *Gennet-Moyl.*

The manner of raising the Quince we have already discoursed, where we treated of raising Stocks to Graft on. *Quinces.*

Filberds are generally drawn as Suckers from the old Trees, and will prosper very well, and sooner come to be Trees, than from the Nut. *Filberds.*

Any shoot of the last year, more especially if a short piece of the former years growth be cut with it, will grow, being laid about a Foot or eighteen Inches within the Ground long-ways, and not above two or three Buds at most out of the Ground, about the Month of February, and watered well in the drought of Summer. *The Vine.*

The Fig-tree yieldeth Suckers, which is the usual way to multiply them. *Figs.*

The Mulberry is a very difficult Tree to raise, and is best done thus: Cut a Bough off as big as a mans Arm, and cut it in pieces a yard long, or less: Lay all these in the ground a Foot deep, only one end out of the Ground about a hands breadth; let it be in fat and moist ground, or usually watered; and after a year or two divers young Springs may be drawn with Roots, and planted at a distance, and the old Roots will yet send out more. *Mulberries.*

These three kinds of Fruits yield such plenty of Suckers, that you never need doubt of a Supply. *Goosberries, Currants, and Barberries.*

But

But if you desire Plants from the same, or any other sort of precious Fruits or Plants, and where you cannot obtain Suckers from the Roots, and where the Brancher will not easily take Root, being separated from the Tree, you may obtain your desire by bending down some Branch of the Tree to the Ground, and with a hooked stick thrust into the ground, stay the same in its place, and cover the same Branch with good Earth as thick as you shall think fit, & keep the same well watered; or if you cannot bring the Branch to the Earth, you may have some Earthen Pot, Basket, or such like, with a hole in the bottom, and fasten the same to the Wall (if against a Wall) or on some Post or Stake: put the Sprig or Branch you intend to Plant through at the hole, and fill the same with good Earth, and water it often as before: Some prick the Rinde that is in the Earth, full of holes, that it may the better issue thereout small Roots; others advise to cut away the Bark. This may be done in the Spring from *March* to *May*, and the Plant will be fit to cut off below the Earth the Winter following. By this means you may obtain the Plants of Vines, Mulberries, or any manner of choice Fruits or Plants.

S E C T. IX.

Of the Transplanting of Trees.

1 The time to transplant.

The best & most successfull time for the transplanting or removing of Trees (such that shed their Leaves in the Winter) whether they are the young Stocks, of new Grafted Trees, or of longer standing, is in the Autumnal Quarter, when the Trees have done growing: about the end of *September* you may begin: the prime time is about the middle of *October*. You may continue till the Tree begins to Bud, if the weather be open.

2 The manner of transplanting.

Be careful in taking up the Plants, that requiring great care of the Remover. See the Roots be left on as much as may, especially the spreading Roots, and let the Roots be larger than the Head, the more ways they spread the better; but you may take away such Roots as run downwards: Also take off the Leaves, if any, lest they weaken the Branches by extracting the Sap.

The younger and lesser the Tree is, the more likely he is to thrive & prosper; because he suffers less injury by the removal, than an older or greater Tree: and an Orchard of young Trees will soon overtake another planted with larger Trees at the same time.

Plant not too deep, for the Over-turf is always richer than the next Mould: And in such places where the Land is Clayish, over-moist or Spewy, plant as near the Surface as you can, or above, and raise the Earth about the Tree, rather than set the Tree in the Wet or Clay. The same Rule observe in Gravelly or Chaulky Land, for the Roots will seek their way downwards, but rarely upwards: that I have known Trees planted too deep pine away, and come to nothing. This Rule observed, many places may be made fruitful Orchards that now are judged impossible, or not worth ones while.

In the transplanting of your young Trees, you may prune as well the Branches as the Roots, taking away the tops of the Branches of Apples and Pears, but not of Plums, Cherries, nor of Wall-nuts.

The

The Coast also is necessary to be observed, especially if the Tree be of any considerable bigness, that the same side may stand South that was South before, as was observed before in the removing of Timber-Trees, the Tree will thrive the better: Although in small Trees it be not much observed, yet it must prove none of the least helps to its growth and thriving. The most facile way to preserve the memory of its situation, is to mark the South or North side of the Plant with Oker, Chalk, or such like, before you remove it.

It is not a small check to a Plant, to be removed, out of a warm Nursery in the open Field, where the Northern and Eastern Winds predominate; or its shelter to be removed, as by the cutting down of Hedges, and other Trees that formerly defended them.

It is also very necessary to be observed, that the Ground into which you Plant your Tree be of a higher and richer Mould than from whence you removed it, if you expect your Tree to thrive; the change of Soyls or Pastures, from the worser to the better, being of very high concernment for the improvement and advance of all Vegetables and Animals.

These, and several other the like Observations, if they can be observed, will much advance the growth of your Tree for the first year or two; but if place and time, and other accidents, will not admit thereof, in a short time the Plant may by the care and diligence of the Planter, overcome those inconveniencies or obstructions.

Let not the Ground wherein you plant Apples be too much enriched with Dung, they requiring rather a vulgar and ordinary light Mould.

But let it never be too fertile made.

For as a Tree due nourishment may want,

So too much Soyl destroys the tender Plant.

According to the nature or quality of your Ground or Trees may the distance be; but the usual distance, and most convenient for Apple-Trees ^{3 The distance of Trees.} or Pears-Trees for an Orchard, may be from twenty to thirty Foot, if you expect the benefit of the Land, under and between them, either for Grass or Tillage, or that you plant them in your Fields or Pastures; then from thirty to sixty Foot may your distance be: the farther distant they are, the more benefit and refreshment do they receive from the Sun and Air; the Fruit are much the better, and the Trees prosper the better also: and if they are too near together, the Ground is for the most part of no advantage under them, neither do the Trees thrive so well, nor are so fertile.

Cherry-Trees, Plum-Trees, Quince-Trees, and such like, may be Planted about fifteen or twenty Foot distance, which is sufficient.

Wall-Trees, may be Planted at such a distance, as the height or breadth of the Wall, the nature of the Tree, and the nature of the Ground requires: the higher the Wall, the nearer together the Trees; and the lower the Wall, the farther distance, that they may have the room to spread in breadth which they want in height. Vines require a more spacious and ample Wall or Place to spread against than any other Fruit; next to that the Pear, then the Aprecock, the Peach, the Nectarine, and then the Cherry, the May-Cherry, &c.

For the distance of other small Trees, as Filberds, Goosberries, Currants, &c. you may plant them at such convenient distance, that the Branches may not intangle the one in the other, according to your own discretion.

Codlings, Cherries, Plums, &c. may be planted to make Hedges withal, and then are to be Planted near together: the nearer, the sooner it will be a Hedge; the farther distance, the more Fruit will they bear, but not so soon a Hedge.

If you desire to fill your Plat of Ground with all sorts of Fruits for your greatest advantage, then Plant several Rows of Apples and Pear-trees at a convenient distance in each Row, but the Rows of a farther distance each from the other; and then about ten or fifteen Foot on each side the Rows of the greater Trees, Plant a Row of Cherries, Plums, or such-like Trees, of a lesser stature or growth, and nearer together than the Apple or Pear-Trees: Next unto them also, at a convenient distance, a Row of Filberds; and next unto them Goosberries, Currants, Raspberries, or such-like small Fruit, leaving only a Walk between the lesser Trees: For by this means will the whole Ground be supplied; and by that time that the greater Trees are grown to any competent stature, the lesser will be decayed, that the greater Trees may have the sole Predominancy.

But the most compleat Order in the Planting of an Orchard of the larger Fruit-Trees, is that which they term the *Quincunx*, by Planting them at an equal distance every way, only with this observation, that every Tree of the second Row may stand against the middle of the space of the first; in the third against the space of the second, and so throughout; which makes it appear pleasing to the Eye, in what part of the Orchard soever you stand.

In Planting of Trees observe this Rule, that if the crookedness of the Tree will inforce you to Plant it leaning, or tending any way, let it be to the West, from whence the strongest Winds blow, or to such Coast your Orchard is most obvious.

S E C T. X.

Of the Pruning of Trees.

It conduceth very much to the proof and growth of a Tree to be Pruned; or the unnecessary and injurious Branches to be taken off by the skillfull hand of the Husbandman.

1. The Pruning of Trees.

When your Grasses are grown half a yard high, those you find to shoot up in one Lance, pinch off their tender tops; which will prevent their mounting, and cause them to put forth side-branches. It's found to be the best way to guide a Tree either to grow, or extend it self in height, or to cause it to spread in breadth; It gives not that wound to Trees that Incisions or Lances usually do; and besides, this may be done at that season, when the taking away of a Bud prevents the expence of Sap in wast, and diverts its course to others necessary to remain.

In *March* is the best time to take away the small and superfluous Branches, giving the Lance close behind a Bud, a thing to be specially observed in Pruning.

2. Of Wall-Trees.

Wall-Trees are to be Pruned in the Summer, and in the Winter. In the Summer about *June* or *July*, you may take off such superfluous sprigs or shoots of the same years growth off from Vines, Aprecocks or other Trees

Trees that put forth many large shoots, that impede the Fruit from its due Maturation, and contract much of the Sap of the Tree to themselves, and thereby rob the other.

In the Winter as soon as the Leaves are off the Trees, you may Prune and cut away the residue of the Branches, and place those that are fit to be left in order. This work may be continued throughout the Winter to the rising of the Sap, except in great Frosts, when it is not good to wound the Vine, or any other tender Plant. Some hold *February* to be the best time to Plash, Prune, and nail Trees, after the great Frosts are past, except Peaches and Nectarines; which being cut before the rising of the Sap, are apt to dye after the Knife, and so stump and deform the Tree: Therefore such must be left till they begin to put forth Buds and Blossoms.

The greater Trees in your Gardens, Orchards, Fields, &c. may be Pruned in *October*, *November*, or thenceforward to the rising of the Sap. Observe to cut away superfluous Branches, such as cross one the other, as grow too thick, or that offend any other Tree or Place, or that are broken, bruised, or decaying; the Tree will be the better preserved, and the remaining Branches will yield the better increase.

In Pruning of Trees, especially the Wall-Tree, be sure to leave the small Twigs that are short and knitted to blossom the succeeding year; for you may observe, that most Aprecocks, Peaches, Plums, Cherries, &c. hang on those Sprigs, being usually of two years growth: These are therefore to be carefully nourished, and not cut off, as is usual, to beautifie the Tree. By this very Observation your Walls shall be full of Fruit, when your Neighbours have but few.

In Wall-fruit cut off all gross Shoots, however fair they seem to the Eye, that will not without much bending be well placed to the Wall; for if any Branch happen to be wreathed or bruised in the bending or turning (which you may not easily perceive) although it doth grow and prosper for the present, yet it will decay in time; the Sap or Gum will also spew out in that place. By neglect of this Observation, many seeming fair Trees decay in several parts, when the Husbandman is ignorant of the cause.

In Pruning the Vine, leave some new Branches every year, and take away (if too many) some of the old; which much advantageth the Tree, and increaseth its Fruit.

When you cut your Vine, leave two knots, and cut at the next interval; ; for usually the two Buds yields a bunch of Grapes. I have observed Vines thus pruned, to bear many fair Bunches, when cut close, as usually is done for Beauty sake (which by the Husbandman is not in this case to be regarded) the Tree hath been almost barren of Fruit.

When you cut any Pirhy Tree, the Vine especially, make your Lance, if the Sprig be upright, on the North-side; if sloping, then make your Lance under; or on one side, that the Wet or Rain lodge not on it, nor decay the Pith, which usually dammifies the next Bud, and sometimes more.

SECT. 2. Wind, or by some other accident, do usually bear great damage to the Trees, and being in Wedges or Stones, for Trees do with stand the cleaving of the Roots in Trees, and being in Wedges or Stones, for Trees do with stand the cleaving of the Roots in Trees, and being in Wedges or Stones, for Trees do with stand the cleaving of the Roots in Trees.

The Pruning of old Trees.

Other observations in Pruning Trees.

S E C T. XL

Other necessary Observations about Fruit-Trees.

1. Of the raising of Land.

Where the Ground is shallow, or lieth near Gravel, Clay, Stone, or Chalk; or near the Water, take the top of one half of the same Land, and lay it on the other in Ridges, abating the intervals like unto Walks, and plant the Trees on the midst of the Ridges; by which means they will have double the quantity of Earth to Root in, that they had before, and the Walks or Intervals preserve the Ridges from superfluous moisture. It hath been found an approved remedy in dry shallow Land, as well as in low wet Land.

Pear-Trees.

It hath been observed, that Pear-trees will thrive and prosper in cold, moist, hungry, stony, and gravelly Land, where Apples will not bear so well.

2. Of the opening the Roots of Fruit-Trees.

The Roots of such Trees that thrive not, nor bear well, may be laid open about November; and if the ground be poor and hungry, then towards the Spring apply good fat Mould thereto; but if the ground be over fat and rich, that the Tree spends it self in Branches & Leaves with little Fruit; then apply to the Roots, Ashes, or Lime, Lees of Wine, or Blood, or any of the Composts that are salt, hot and dry, mixed with the Earth, which contain more of fertility than the ordinary Dung.

Also laying store of any manner of Vegetables all the Summer about the Roots of Fruit-Trees, to kill the Grubs and Worms growing about the Tree, keeps the ground moist and cool, and adds much to the flourishing and fertility of the Tree; and is the best natural Remedy against the Mole; so that it lie not too near the Tree, to decay the Bark thereof.

Digging or Ploughing about the Roots of Fruit-Trees, adds much to their fertility, and prevents the Mole in most Trees.

Stones laid in heaps about the Roots, preserves them cool and moist in the Summer, and warm in Winter; and is of great use and commendment to the fertility, and advance of the growth of Fruit-Trees. So that you use this caution as well in the Vegetables you lay about the Trees, as the Stones. That they lie not too high about the Trunk of the Tree, but rather at some small distance, lest it harbour Vermin that will feed upon or destroy the Bark of the Tree, or else through too much moisture it will rot the same. For it is not the lying of any thing close to the Body of the Tree that avails any thing, but the covering the Ground under which the Roots spread and dilate themselves.

For Trees that thrive well and bear much, is much better usually prescribed to bore a hole through the Bark behind the Tree, to make them bear, which may probably be; for it is observed, that hollow Trees or such that are otherwise hurt or decayed in the Body or Stemm, are more apt to bear than the more sound.

The same reason may be for the cleaving of the Roots in Trees, and putting in Wedges or Stones; for Trees blown aside by the Wind, or by some other accident, do usually bear great quantities, and

and sometimes more than when they stood firm and upright: The reason in both may be, that abundance of Sap run most into Branches when less might produce most Fruits.

Hacking of Trees in the Bark promiscuously, especially if the Tree be Hidebound, doth as it were renew the Bark of the Tree, and makes it more free from Moss, &c.

The Ground wherein you Plant your Fruit-Trees, if you find it not suitable to the nature of the Tree, may be several ways altered as before: and by the applying of Earth, Clay, or Sand, of a divers Nature from the ground where the Tree grows.

If your Orchard or Garden be not naturally well situate, and defended from the injurious Winds by Hills or Woods, or that Buildings, Barns, Walls, or such like, are not conveniently situate to preserve it, it is of great advantage to raise a perpetual, lasting, and pleasant shelter, by Planting a compleat Thorn-Hedge about the same at the time, or in that year you first Plant your Orchard or Garden, which will grow in a few years to a considerable height, and very much break the cold Winds, and preserve the smaller and lower part of the greater Trees, in their blossoming and bearing-time, from the shipping Winds: But for that, the principallest parts of the greater Trees exceed the Summit of the White-Thorn, the Wallnut-Tree raised in time on the borders, on naked sides of the Orchard or Garden, and if you can on the out-sides of the Fences, will prove a Noble and profitable Defence from the furious Winds.

If you regard not the Fruit or Profit, so much as the pleasure and sudden rise of such a Defence, that which is most facile and expeditious to be raised is the Poplar, which may be Planted near together, and ten or fifteen Foot in height the first year, which will prove and thrive wonderfully, especially if the Ground be any what inclinable to moisture.

Of the Lime-Tree, if you can conveniently obtain them make a close and secure Defence from the Winds, and of all other is the most odoriferous, regular, and delicious verdant pale to a Garden or Orchard. The Sycamore and the Elm also are not to be rejected, only the Elm hath an ill name, as being subject to rattle or attract Blights.

At the removal of Trees, the trimmings of the Roots Planted, or rather buried in the ground within a quarter of an Inch, or little more of the level of the Bed, will sprout and grow to be very good Stocks.

Pigeons Dung, or the Dung of Poultry, or any Fowl, being of a hot, dry, and salt nature, hath been experimentally found to be the Soil, most conducing to Fertility for Fruit-Trees, especially in cold Grounds.

Unleis Swines-Dung, which when it is well mixed and tempered, by the Swine with their Feet or otherwise, is undoubtedly the most natural soil for a Fruit-Tree, and the best Medicine for a Canker. It is supposed to be a great Edulcorator and Meliorator of Fruit.

It is usual to select aspiring Trees, and to expect the taller Trees to be easer raller, and better, and more fruit, then those that are low. This is true, the more remote the Branches are from the Earth, the less are they subject to the injuries of Cattle, or the Fruit to light Fingers.

Commonly But

Alteration of Ground.

4. Defending Trees from Winds.

White-Thorn.

Wallnut-Tree.

Poplar-Tree.

Lime-Tree.

5. Raising Stocks.

6. Soil for Fruit-Trees.

7. Height of Trees.

But the lower the Tree brancheth it self and spreads, the fairer and sooner will it attain to be a Tree, and the greater burthen will it bear of Fruit, and those better and larger. The Tree and Fruit will also be less obvious to the furious Winds, which make havock most years of a great part of our Stock; and in the Spring the new-kerned Fruit will be more within the shelter of the Natural or Artificial Securities from the nipping cold morning Breeze; and the Fruit, when ripe and apt to fall, will not receive so great injury from the humble, as from the aspiring Tree. *Sed medio Virtus.* As the tall Tree is not for your advantage; so the Tree that's too low is not for your conveniency. I aim not at Extreams.

3 Diseases of
Trees.
Moss.

In many places Fruit-Trees are much injured by Moss; it rarely grows on Trees where the Ground is yearly Digged, Plowed, or otherwise preserved from Grass or Weeds, as we noted before. If the Dry, Cold, or barren nature of the Ground be the cause, then rectify the same as before. After Rain you may scrape off the Moss with a Knife, or rub it off with a Hair-cloth.

Moss is caused partly from the want of Sap, therefore old Trees are apt to be more Mossy than young, because the Sap is not free enough to expend it self in Branches; Therefore lopping off part of the Branches, maketh the rest prosper the better, and the less Mossy; whence it is that Trees on the more dry Grounds are apt to be Mossie.

Moss is also caused through the coldness of the Land, whether it be moist or dry, for then the Sap riseth slowly, and is not apt to exuberate: As we see in the Spring-bleeding Plants, as the Vine, the Birch, &c. yield their Blood most freely in warm weather, the Cold usually stanching it.

Bark-bound.

If the Tree be Bark-bound, and thrive not well, with a knife you may slit the Bark down the Body of the Tree in April or May, and it will cure it.

Canker.

If the Cleft where the Tree was Grafted, or any other wounded place be neglected, the Rain is apt to ingender the Canker: the Cure is difficult, if too far gone.

Sometimes the Ground it self doth ingender the Canker in Fruit-Trees, and sometimes the Nature of the Fruit is such, that its Trees will be Cankry in some sort of Land more than in other. In these cases you may cut off as much as you can of the Cankry Boughs, and in the Winter-time uncover the Roots, and so let them be open until the Spring, and then apply Swines Dung well tempered, and not too new, and that in great quantity to the Roots; and I do assure you it hath made a cure of a desperately diseased Tree with the Canker. There are many other Prescriptions for the cure of it; but if the cutting off of the Canker, and Cankered Branches, and that Application will not cure it, and the Tree be much infected with it, the best way is to place a better in the room.

Worms in the
Bark.

Some Trees are hurt with small Worms that breed between the Bark and Wood, which makes the Bark swell; cut away part of the Bark, and wash with Urine and Cow dung.

Soyl for Trees.

Strong or hot Dung is not good for fruit-Trees; but after it is thoroughly rotten and cold, it may be mixed in cold Grounds with success, but in rich or warm Land. Any Dirt or Soyl that lies in Streets or Highways, where it may be had, is best, especially for the Apple-Tree.

Commonly

Commonly Husbandmen apply Soyl, Fern, &c. to the stems of their Trees; and if they dig to apply it, it is usually near the Body of the Tree, which will not answer the trouble; for the Roots that feed the Tree, spread far from the Trunk or Stem: therefore the Soyl that is to be applyed should be laid at a convenient distance proportionable to the spreading of the Roots; wherein the long standing of the Tree is to be considered; Digging about the Roots of Trees should also be used accordingly.

How to apply
Soyl to
Trees.

In Planting of Trees, it's usual to apply good Mould, or other additional Soyl, to fill up the Foss after the placing the Tree; which conduceth not so much to the prosperity of the Plant, as to place the better Mould or Soyl in the bottom of the Foss, and then Plant your Tree on it, spreading its Roots over the good Soyl; for all Roots of Plants as naturally tend down-wards and side-ways, as the Branches spread and advance up-wards: So that the Soyl that lies above the Roots, only yields some farness which the Rain washeth down unto them; but the Soyl that is under, the Roots flourish in it. The difference that is in this case, may at any time be sensibly perceived by the Experienced.

It hath been observed, that most sort of Vegetables fade or degenerate by too often being Planted or Sown, or too long a continuance in the same Soyl; and that the Land whereon Trees and Plants have stood long, on their removal hath spontaneously put forth other Trees or Plants of a different species, of a meaner or baser sort. As where Oaks have been eradicated, Beech have succeeded, and not from Seed, but from the natural inclination of the Earth; and after Beech, Birch have been produced.

It hath been also affirmed that Wheat by being often Sown on the same Land, hath degenerated into Rye. But that it hath been is probable, where the Land hath been naturally inclined to that Grain, else it would have degenerated into Smut, Ray, Darnel, or Wild Oats.

Therefore wheresoever your Orchard, or other Plantation is old, that you are compelled to extirpate your decayed Trees; either let out other Land that hath not yet been Planted with those Trees you intend to propagate, or supply the defects of your Plantation with Fruit-trees of another species or kind; or else make your Fosses large, and let them lye open and take the Air, one or two years at the least, that the Sun, Frost, and Rains may thoroughly cleanse the Earth from the Savour of the old putrid Roots, and re-impregnate it again with its former fertile Juice or Spirit; but if your patience be not sufficient for two years delay, then supply it by the change of the earth about the Root of your new Plant, and at some distance from it, that it may have room to extend its Roots for two or three years, untill such time as the other contiguous parts are meliorated.

S E C T. XII

Of the use and benefit of Fruits.

Not any of the afore-mentioned Fruits but are very pleasant, necessary, and profitable to many of our English Palats and Purles; the most of them being a familiar Food to the Noble and Ignoble. These extend their Virtue also to the cure of many Infirmities or Diseases, being judiciously applyed.

But over and above their use for Food, for Pleasure, and for Physick, to be converted into so many several sorts of curious, pleasant, palatable, and lasting Liquors, is not the least of the benefits accrewing unto the Husbandman from the diversity of Fruits by him propagated. Next unto Wine (whereof we treat not in this place) Cider is esteemed the most pleasant natural Liquor our English Fruits afford.

By Cider. Several are the ways used in making this excellent Liquor, and that according to the skill of the Operator, and divers kinds of the Fruit whereof it is made.

Cider-Fruits may be reduced into two sorts or kinds; either the wild, harsh, and Common Apple, growing in great plenty in *Hereford, Worcester, and Gloucestershire*, and in several other adjacent places in the the Fields and Hedge-rows, and planted in several other places of *England*, for Cider only, not at all tempting the Palate of the *Thief*, nor requiring the Charge and Trouble of the more reserved Inclosures.

Or the more curious Table-Fruits, as the *Pippin, Pearmain, &c.* which are by many preferred to make the best Cider, as having in them a more Cordial and pleasant Juycethan other Apples.

Cider-Fruits. For the former, the best sorts for Cider are found to be the *Red-streak, the White-Must, and the Green-Must, the Gennet-Moyl, Eliots, Stocken-Apple, Summer-Fillet, Winter-Fillet, &c.*

The greater part of them being meerly savage, and so harsh, that hardly Swine will eat them, yet yielding a most plentiful smart and winy Liquor, comparable, or rather exceeding the best French-Wines: and for the advantage of Planting them, they claim a preference before *Pippins*, or any other of our pleasant Garden-Fruits, especially the *Red-streak*, which *Mr. Evelyn* so highly commends, as at three years Grafting to give you fair hopes, and last almost an hundred years; and will bear as much Fruit at ten years, as *Pippins* and *Pearmains* at thirty.

The best sort of Cider-Fruit are far more succulent, and the Liquor more easily divides from the Pulp of the Apple, than in the best Table-Fruit.

Some observe, the more of Red any Apple hath in his Rind, the better for the Cider; the paler the worse. No sweet Apple that hath a tough Rind, is bad for Cider.

But

But you may be confident that the more inclinable to yellow the fleshy part of any Apple is, the better, and better coloured the Cider will be.

Cider-Apples require full maturity, e're they be taken from the Trees: And after they are gathered (which is to be done with as much caution ^{Making of Cider.} as may be, to preserve them from bruises) it very much conduces to the goodness and lasting of the Cider, to let them lye a week or two on heaps out of the Rain and Dew: the harsher and more lolid the Fruit is, the longer may they lye; the more mellow and pulpy, the less time. This makes them swearforth their Aqueous Humidity, injurious to the Cider, and matureth the juice remaining, and digesteth it more than if on the Tree, or in the Vessel: But it's probable they will yield more from the Tree than so kept, but not so good.

Such as are Wind-falls, bruised, or any ways injured, or unripe Fruit, divide from the sound and mature. It's better to make two sorts of Cider, the one good, the other bad, than only bad. Take away all stalks, leaves, and rotten Apples; the stalks and leaves give an ill taste to the Cider, the rotten Apples make it deadish.

Let such as are through casualty, or otherwise, fallen from the Trees before their full time of maturity, be kept to the full time, else will not the Cider be worth the drinking.

About twenty, or twenty two Bushels of good Cider-Apples from the Tree, will make a *Hogshead* of Cider; after they have lain a while in heaps to mellow, about twenty five Bushels will make a *Hogshead*.

The usual way of grinding Apples hath been in a Horse-Mill, as Tanners grind their Bark: Or else they have been beaten with Beaters in a Trough of Wood or Stone, the former way being very chargeable, such a Mill taking up much room, and costing 20 or 30 Pounds the making, and not grinding any more Apples than will make three or four *Hogsheads* of Cider in a day, with the help of a Horse and a Man; the other way of beating being much more tedious and laborious.

Therefore I commend unto you my *New invented Ingenio* for the speedy, easy, and effectual grinding of your Apples, approved by the several years experience of many judicious Ciderists. It will grind, by the help of one to turn and another to feed it, 20, 30, or 40 Bushels of Apples in an hour, according as it is in bigness: It will stand in a little room, is easily portable, and of small Price, but if you will encrease the Charge, it may be made to grind 50, 60, or more Bushels in an hour, and may be made to go by the help of the Wind or Water. These *Ingenioes* are curiously made by *Henry Allen* at the *Cabinet* in *Exeter-street*, near *Exeter-Exchange* in the *Strand*, who is the only person that maketh them *secundum Artem*.

After the grinding it should be Prest, either being Artificially made up with straw, in form of a Cheese, as the experienced Country-man may direct you, or in a Hair-bag (the more ordinary way for small quantities) and so committed to the *Press*; of which there are several sorts, but the *Screw-press* is to be preferred.

After it's prest, strain it, and put it into a Vessel, and place it where it may stand to *Ferment*, allowing but a small *Vent-hole*, lest the spirits waste: Fill not the Vessel quite till it hath done working; then fill the Vessel of the same, kept for that purpose, and stop it well, only with caution at the first, lest it break the Vessel.

The best Vessels for the Tunning up of Cider, and to preserve it, are those whereof the Barrel-Boards are streight, the Vessel broader at the one end than the other, and standing on the lesser end, the Bung-hole on the top; the conveniency is, that in the drawing the Cider, though but slowly, the Skin or Cream contracted by its Fermentation descends, and wholly covers the Liquor by the tapering of the Vessel, and thereby preserves the Spirits of the Cider to the last, which otherwise would waste and expend themselves.

If you intend a mixture of water with your Cider, let it be done in the grinding, and it will better incorporate with the Cider in the grinding and Pressing, than afterwards.

Some Cider will bear a mixture with Water, without injury to its preservation, others will not; therefore be not over-hasty with too much at once, till you understand the nature of your Fruit.

Some advise, that before it be prest, the *Liquor* and *Must* should for four and twenty hours ferment together in a Vat for that purpose close covered, which is said to enrich the Liquor.

Other Cider-Fruits.

The other sorts of Fruits for the making of Cider, are the Pippin, Pearmain, Gilliflower, &c. by many preferred; with whom we may rank all sorts of Summer-Apples, as the *Kentish Codling*, *Marigolds*, and all other sorts of *Pippins* and *Pearmains*, &c.

Which after they are thorough ripe, and laid on heaps to sweat (as before is directed) and ground or beaten, and Prest as the other, then is not this Cider or Must to be tunned up immediately, but suffered to stand in the Vat four and twenty hours, or more; according as the Apples were more or less pulpy, and close covered with Hair-cloaths or Sacks, that too much of the Spirits may not evaporate, nor be kept so closely in as to cause Fermentation; in which time the more gross part of the Feces will precipitate or fall to the bottom, which otherwise would have prejudiced the Cider by an over-fermentation, and have made it flat and fowre.

Then at a Tap, three or four inches from the bottom of the Vat, draw forth the Cider, and Tun it up, wherein is yet a sufficient quantity of that gross Lee or Feces to cause Fermentation, the want of the right understanding whereof, is one of the main causes of so much bad Cider throughout England.

2. Of the making of Perry.

Sorts of Pears.

Non omnia fert omnia Tellus. In some places Pears will thrive where Apples will not; the Trees are larger, and bear greater quantities than Apple-trees. In *Worcestershire* they have great plenty of Pears for Perry, and also in the adjacent Countries; The best for Perry are such as are not fit to be eaten, so harsh that Swine will not eat, nay hardly smell to them, the fitter to be Planted in Hedge-rows, &c. The *Bosbury-Pear*, the *Horse-Pear*, the *Bareland-Pear*, and the *Choak-Pear*, are such that bear the name of the best Pears for Perry; the redder they are the more to be preferred.

Pears are to be fully mature ere they be ground, and let lye on heaps as the Apples.

Crabs and Pears ground together make an excellent Liquor; the Crabs helping to preserve the Perry.

The

The method of making *Perry* differeth not from that of *Cider*.

3. *Some Observations concerning Cider.*

Thick *Cider* may by a second Fermentation be made good and clear, but Acid *Cider* is rarely recovered.

Wheat unground, about a Gallon to a Hoghead, or *Leven* or *Mustard* ground with *Cider*, or much better with *Sack*, a Pint to a Hoghead, is used either to preserve or recover *Cider* that's in danger of spoiling.

Ginger accelerateth the Maturation of the *Cider*, giveth it a more brisk Spirit, helpeth Fermentation, and promoteth its duration.

New Vessels affect the *Cider* with an ill savour and deep colour; therefore if you cannot obtain Wine-Cask, which are the best, nor yet can season your own with Beer, or other Drinks, then scald it with Water, wherein a good quantity of *Apple-pounce* hath been boiled.

Put not *Cider* into a Vessel wherein strong Beer or Ale hath lately been, especially strong Beer, for it gives a very unpleasant rank taste to *Cider*, so doth a *Cider* Vessel to Beer: Therefore a Small-beer Vessel is to be preferred to a Strong beer Vessel.

If the Vessel be tainted, then boil an ounce of Pepper in Water enough to fill the Vessel, and let it stand therein two or three days.

Or take some Quick-Lime and put it in the Vessel, which slacken with Water: close stop it, and tumble it up and down, till the Commotion cease.

Two or three Eggs put into a Hoghead of *Cider* that is sharp, sometimes lenifies it: Two or three rotten Apples will clarify thick *Cider*.

The mildness and temperance of the weather is of much concernment in the Fermentation of *Cider*.

Boil *Cider* immediately after the Press, before Fermentation.

Wheaten-Bran cast in after Fermentation, thickens the Coat or Cream, and much conduceth to its preservation.

The *Cider* that runs from the ground or beaten Apples, before they are in the Press, is much to be preferred.

Let the Vessel not be quite full, that there may be room for the *Cider* to gather a Head or Cream.

Pare six or eight Pippins, or other good Apples, and quarter them, and Core them, and put them into a Hoghead of *Cider*, and it will preserve it, and make it drink brisk and pleasant.

Pearmains make but small *Cider* of themselves.

Botling is the only way to preserve *Cider* long. It may be Botled two or three days after it is well settled, and before it hath thoroughly fermented, if it be for present drinking; or you may bottle it in March following, which is the best time.

Bottles may be kept all the Summer in cold Fountains, or in Cellars in Sand: If they are well corked and bound, they may be kept many years in cold places; the longer the better, if the *Cider* be good.

Bottles of *Cider* are kept better on a cold Flore than in Sand, and in a deep Vault, or near a cold Fountain, than in the Water. Their standing in Sand or in Water is said to make the Liquor drink flat.

After *Cider* hath been botled a week, (if new *Cider*, else at the time of botling) you may put into each bottle a piece of white Sugar as big

as a Nutmeg: this will make it brisk. But if the Cider be to keep long, it will be apt to make it turn soure.

If your Bottles be in danger of the Frost, cover them with straw: about April set them in your coldest Repositories.

It is not the best way to grind or beat Apples in Stone-troughs, because it bruises the Kernels and Tails of the Fruit too much, which gives an ill savour to the Cider, but beaten or ground in wooden-troughs frees it from that quality. But in the beforementioned *Ingenio* it is better than any other way.

After your Apples are beaten or ground, it's the best way to let them stand a day or two before you Press them; for the Cider doth a little ferment and maturate in the Pulp, and obtains a better colour, than if immediately Pressed.

After they are Pressed, it's good to let the Cider stand in a Vat covered, to ferment a day and night, before you Tun it up; and then draw it from the Vat by a Tap, about two Inches from the bottom, or more, according to discretion, leaving the Feces behind, which will not be lost, if you put it upon the Chaff, for then it meliorates your Pur, or Water-Cider, if you make any.

When your Cider is Tunn'd into the Barrel where you intend to keep it, leave some small Vent open for several days, untill it's wild spirit be spent, which will otherwise break the Barrel, or find some vent that will always be open (though but small) to the ruin of your Cider. Many have spoiled their Cider by this only neglect, and never apprehended the cause thereof; which when stop'd close, after this wild spirit be spent (although seemingly flatish at first) will improve, and become brisk and pleasant Cider in a little time.

If Cider prove thick or sowrish, bruise a few Apples pared and cored and put in at the Bung of your Barrel, and it will beget a new Fermentation, and very much mend your Cider, so that in a few days after you draw it off into another Vessel.

If Cider be only a little sowrish, or drawn off in another vessel, the way to correct or preserve it, is to put about a Gallon of Wheat (blanch'd is best) to a Hogshead of Cider; and so according to that proportion, to a greater or lesser quantity, which will as well amend as preserve it.

If Cider hath any ill savour or tast from the Vessel, or any other cause, a little Mustard-seed ground with some of the Cider, and put to it, will help it.

Mixture of Fruit is of great advantage to your Cider: the meanest Apple mixt make as good Cider, as the best alone; always observing, that they be of equal ripeness, except the Red-freak, and some few celebrated Cider-Apples.

The best Mixture is the Red-freak and Golden-Rennet: it is probable any other Apple with a yellow inside may mix well with the Red-freak.

4. Of the Wines or Juices of other Fruits.

If Cherries were in so great plenty that the Markets would not take them off at a good rate, they would become very beneficial to be converted into Wine, which they would yield in great quantity, very pleasant and refreshing, and a finer, cooler, and more natural Summer-drink than

than Wine. It may also be made to keep long: Some hath been kept a whole year, and very good.

Although it may not prove so brisk, clear, and curious a Drink as *Cherry-Wine*, yet where *Plums* are in great plenty (they being Trees easily Propagated) a very good Wine may be made of them; according to the great diversity of this sort of Fruit, you must expect divers Liquors to proceed from them. The black tawny Plum is esteemed the best. *Wine of Plums.*

The Mulberry yields a good Wine, being prepared by a skilful hand; the natural Juice serves, and is of excellent use to add a tincture to other paler Wines or Liquors. *Mulberry-Wine.*

England yields not a Fruit whereof can be made a more pleasant drink, or rather Wine, than of this humble fruit: if compounded with other Wines or Drinks, it animates them with so high a fragrant savour and gust, that it tempts the most curious Palats. *Raspberry-Wine.*

The Juice of Currans, boiled with a proportionable addition of Water and Sugar, makes a pleasant Wine to the eye and taste, it being duly fermented and bottled. A great quantity of this Fruit may also be raised in a little ground, and in few years. *Wine of Currans.*

Of the Juice of Goosberries extracted in due time, and mixed with Water and Sugar, is prepared a very pleasant cooling Repast. This Fruit is easily propagated, and yields much Liquor: It's usually made unboiled, because it contracts a brown colour in the boiling. *Goosberry-Wine.*

Whorts or Whortleberries, by some called Bilberries, make a curious Wine, preferable to any of the said wines, by Pressing out their Juice, and mixing the same with a due proportion of Water and Sugar. *Whort-Wine.*

But for the more full and ample discourse of the manner of Planting and Propagating all sorts of *Vinous Fruit-Trees*, and their Natures, and the several ways of extracting and preparing their Juices, and making the several *Ingenioes* and Presses for the Grinding and Pressing of Fruit, and the more particular ways of ordering all the aforesaid Liquors, with several others, I refer you to my *Vineta Britannica*, lately Printed.

CHAP. VIII.

Of such Tillage, Herbs, Roots and Fruits, that are usually Planted and Propagated in Gardens and Garden-grounds, either for necessary Food, Use, or Advantage.

The advantage of Garden-Tillage in general.

Most of these several sorts of *Tillage*, whereof we are now to treat in this Chapter, will raise unto the Industrious Husbandman an extraordinary advantage, and are not to be esteemed amongst the least of Improvements; for each sort being properly Planted in such ground they most naturally delight in, and being well Husbandried, and judiciously ordered, produce an incredible advantage.

But think not this strange, that common and well known Plants, that are so natural to our English Soyl, should prove so beneficial; it is for no other cause, then that some men are more Industrious and Ingenious than others: For these Garden-Plants prosper not without great Labour Care, and skill, and besides are subject more than others to the injuries of unseasonable weather. Neither of which the slothfull or ignorant Husbandman can away with; affecting only such things that will grow with least toyl, hazard, or expence, though they feed on bread and water, when the diligent and industrious Adventurer lives like a petty Prince on the fruit of his labour and expectation, which sufficiently repays his expence and hazard. It is hard to find any Trade, Occupation, or Employment, that a man may presume on a large and noble requital, of his time, cost, or industry, but it is hazardous, especially to such that attempt the same without a special affectation thereunto, or skill therein.

Nil tam difficile est quod non Solertia vincet,

So this Art and Imploymment of Planting, Propagating, and Encreasing of *Hops, Saffron, Liquorice, Cabbage, Onions*, and other Garden Commodities, being casual, and more subject to the injuries of the weather than commonly Corn or Grasse is, makes it so much neglected; for one bad Crop, or bad year for any of them, shall more discourage a Countryman from a Plantation thereof, than five good Crops, though never so profitable and advantageous shall incourage: Ignorant and self-willed men are naturally so prone to raise Objections, on purpose to deter themselves and others from any thing whatsoever that is either pleasant or profitable.

But we hope better of the Ingenious, that they will set to their helping hand to promote this useful and necessary *Art*, and thereby become a provoking President to their ignorant Neighbours, that our Land may be a Land of Plenty, that it may superabound with necessaries, and rather afford a supply to their Neighbours, than expect it from them, as we are inforced to do in several sorts of those things we treat of in this Book: Those of our own growth also far exceeding that we have abroad;

broad; which inconveniencies and disadvantages nothing can better prevent, than our own Industry and Ingenuity.

Besides, most of this Garden-Tillage is of late years become a more general Food than formerly it was: Scarce a Table well Furnisht without some dishes of choice Roots or Herbs; and it is not only pleasant to the Rich, but good for the poor labouring man; many, where Plenty is, feeding for the most part on Tillage, which hath occasioned that great encrease of Gardens and Plantations in most of the Southern Parts of England. Several sorts also of Tillage being profitable in the feeding of Cattle and Fowl.

SECT. I.

Of Hops.

We mention this Plant in the first place, not for his worth or dignity above the rest, it being esteemed an unwholsome Herb or Flower for the use it is usually put unto, which may be supplied with several other whollfomer and better Herbs; but for that of all other Plants it advanceth Land to the highest improvement, usually to forty Pound, or fifty Pound, sometimes to an hundred Pound per Acre.

And yet have we not enough planted to serve the Kingdom, but yearly make use of *Flemish Hops*, nothing near so good as our own. The principal cause I presume is, that few bestow the labour & industry about them they require, & sufficiently retaliate; for being managed carelessly, they scarce yield a quarter part of the increase that those yield that are dexterously handled, though with very little more cost. Another cause is why they are no more Propagated here, that they are the most of any Plant that grows subjected to the various Mutations of the Air, from the time of their first springing, till they are ready to be gathered. Over-much drought or wet spoils them: Mill-dews sometimes totally destroys them; which casualties happening unto them, makes their Price and valuation so uncertain, & proves so great a discouragement to the Countryman; else why may not we have as great a Plenty of them, as in *Flanders, Holland, &c.* Our Land is as cheap, and affords as great a Crop (if as well Husbanded) and we pay not for carriage so far, but that they are more industrious than us: Therefore seeing that is so gainfull a Commodity to the Husbandman, and that there is a sufficient vent for them at home, we shall be the more Prolix in the subsequent discourse.

The Hop delights in the richest Land; a deep Mould, and light; if mixed with Sand its the better; a black Garden-Mould is excellent for the Hop.

Best Land & Situation for a Hop-garden.

If it lye near the Water, and may be laid dry, it is by much the better.

Most sorts of Land will serve, unless stony, rocky, or stiff Clay ground, which are not to be commended for the Hop.

If you can obtain it, a Piece of Land a little inclining to the South and that lyes low, the ground mellow and deep, and where Water may be at command in the Summer time, is to be preferred for a Hop-Garden.

Also

Also it ought to lye warm and free from impetuous winds, especially from the North and East, either defended by *Hills* or *Trees*, but by *Hills* the best.

Defending the
Hop-garden by
Trees.

Every one cannot have what Land he pleaseth, but must make use of what he hath; therefore if your ground lye obvious to the winds, it is good to raise a natural defence therefrom, by Planting on the edges of the Hop-garden a border or row of Trees that may grow tall, and break the force of the winds at such time the Poles are laden with Hops. The *Elm* is esteemed not fit to be Planted near the Hop, because it contracted *Mill-dews*, say our Country Hop-Planters; the *Asb* on a dry ground, and the *Poplar* or *Aspen* on a moist, are to be preferred for their speedy growth. Also a tall and thick hedge of *White-Thorn* keeps the ground warm, and secures it in the *Spring* from the sharp nipping winds that spoil the young Shoots.

Aspen.

Preparing the
Ground and
distance of
the Hills.

If your Land be cold, stiff, sowre or barren, that you design for a Hop-Garden, the best way is, about the latter end of the Summer, to burn it (as before we directed) which will be very available to the amendment of the Land. Some also prescribe to sow *Turnips*, *Hemp*, or *Beans* therein, to make the ground light and mellow, and destroy the Weeds.

But in what soever state or condition your ground be, Till it in the beginning of the Winter, with either Plough or Spade.

And when you have set out the bounds of your ground you intend to Plant, and laid the same even, then must you mark out the several places where each hill is to be: The best way is by a Line streightned overthwart the ground with knots or threds tyed at such distance you intend your Hills. Some Plant them in squares *Chequer-wise*; which is the best way, if you intend to Plough with Horses between the Hills: Others Plant them in form of a *Quincunx*, which is the more beautiful to the eye, and better for the Hop, and will do very well where your ground is but small, that you may overcome it with either the *Breast-Plough* or *Spade*: which way soever it be, pitch a small stick at every place where there is to be a Hill; and when it is all so done, in case your ground be poor or stiff, bring into it of the best Mould you can get, or a parcel of Dung and Earth mixed; and at every stick dig a hole of about a Foot square, and fill it with this Mould or Compost wherein your Plants are to be set, they will thrive the better, and the sooner come to bear, and sufficiently repay your charge and trouble.

Distance of
the Hills.

Great Variety there is both in the judgment and the Practice of most men about the distance of the Hills, by reason of the different Seasons: Sometimes it falls out to be a moist year, and then the Hop grows large; and the wider the Hills are, the better they prove. Some years also prove hot and dry, the Hops then grow thin; and the nearer they are the more Hops they have: But let me advise you to keep a convenient distance, that you may have room sufficient to come between, and ground sufficient to raise the Hills with the Parings or Surface of it; and that the Sun may come between, and that the Poles may not be driven one against the other with the winds, when they are laden.

If your ground be dry and burning, about six foot may be a convenient distance; but if it be a moist, deep, and rich Mould, subject to bear large Hops, then eight or nine foot distance is most convenient; and so according to the goodness of the ground, place the distance of the Hills.

But

But if your Hills are too far asunder, the best way to remedy that in- *Bigness of the Hills.* convenience, is by increasing the number of Hops in the Root in each Hill; by which means you may apply more Poles, and supply the former defect. Hills may be made of that bigness, that they may require six, ten, or twenty Poles. The common objection is, they cannot so conveniently be dressed; but I only propose it as an amendment, to make them somewhat bigger then ordinary: Or if your Hills be too near together, you may also abate the Hops, and apply the fewer Poles; for over poling of a ground, as well in number as height, injures it more than under-poling.

Authors, and most Practisers, usually advise to plant Hops in the end *Time of* of *March* or in *April*; but some of our best experienced Planters affirm it *planting Hops.* to be the best in *October*, before the cold Winter; and that then the Hops will settle against the Spring.

Chuse the largest Sets that you can get; which are to be had best out of *Choice of Sets and manner of* a Garden well kept, and where the Hills have been raised very high the *Setting.* precedent year, which increaseth the Plants both in number and bigness: Let them be as long as you can get them; about eight or ten Inches may be of a very good length, and in each Plant three or four Joynts or Buds.

Before you have your Sets out of the ground, makes the holes ready to put them in, if you can, else you must be forced to lay them in cold and moist Earth, and take them out as you have occasion to use them: dig your holes according to the depth of your Plant, eight, ten, or twelve Inches deep, and about a Foot over.

Some take two or three of the Plants, and joyn the tops together, and set them bolt-upright, directly in the middle of the hole, holding them hard together with the one hand, while you fill the hole with the other, with fine Mould prepared and made ready before-hand for that purpose; observing that you set the tops even with the Surface of the ground, and the same end uppermost that grew so before; then fasten well the Earth about the Roots.

Others place at each corner of the hole a Plant; which way is to be preferred before the other.

It is convenient to raise the Earth two or three Inches above the Set, unless you plant so late, that the Green Sprigs are shot forth; then you are not to cover them wholly, lest you destroy them.

Beware of wild Hops, which are only discerned by the Stalk and Fruit.

If your Hops be old and ill-Husbandried, or worn out of heart, then *Dressing Hops.* about the beginning of Winter dig them, and take away as much of the old barren Earth as you can, and apply good fat Mould or Compost to their Roots; or if you cannot conveniently, or think it not fit to do it before Mid-winter, yet neglect not to do it in *January* or *February* at the furthest, the weather being open; for such Winter-dressing, and renewing their Mould, is a principal Renovation to a decaying Hop: or if your Hop-ground be full of Weeds of Quick-grass, such Winter digging of it destroys them.

But if your Hops be in good heart, and strong, then late dressing is most proper, which restrains them from too early springing, which is the cause of many injuries to the Hop: The only time for such strong Hops to be dressed in is *March*; some dress in the beginning of *April*.

In the dressing of Hops these Rules are necessary to be observed: First, to pull down your Hills, & undermine them round about, till you come near to the principal Roots; and then take the upper or younger Roots in your hand, and shake off the Earth; which Earth being removed away, with your said Tool you shall discern where the new Roots grow out of the old Sets; in the doing whereof, be carefull that you spoil not the old Sets: as for the other Roots that are to be cut away, you shall not need to spare them to the delay of your work, except such as you mean to Set.

Take heed that you uncover not any more than the tops of the old Sets in the first year of cutting: at what time soever you pull down your Hill, cut not your Roots before *March*.

At the first dressing of young Hops, cut away all such Roots or Sprigs as grew the year before out of your Sets, within one inch of the same: every year after you must cut them as close as you can to the old Roots, even as you see an Oliers head cut, say your Authors; but it is found experimentally to be advantageous to a weak Hop, to leave some principal new Shoots at the dressing: and that the clean cutting off of them, hath very much decayed a Hop Garden.

The Roots that grow downward are not to be cut, but such that grow outward at the sides of the Plants may, else they will incumber the ground.

The old Roots are Red, these of the last year White; if there be any wild Hops, you must take up the whole Hill, and new plant it, marking the Hill with a stick at the Hop-Harvest, to prevent mistakes.

When you have dressed the Roots, then apply of your rich Mould or Compost prepared for that purpose, and make the Hill not too high at first, lest you hinder the young Shoots; although the Hops be sprung out of the Hills, yet fear not the cutting of them off when you dresse them.

Be sure to keep Poultry, and especially Geese, out of the Hop-Garden, especially during the Spring.

According to the distance of your Hills, and nature of your Ground, provide the number of your Poles; and according to the strength of the Hop, the length or bigness.

If the Hills be wide, the more Poles, sometimes four or five to a Hill; if the Hills are near, then two or three may suffice: In hot, and dry, and hungry ground, the Poles may stand nearer than in rich mellow Land, where they are more subject to grow gross and hawny.

Also if your Hops be strong, and Ground rich, provide large Poles, either in bigness or in length, or else you loose the best of your profit for want of Poles; but if they are poor, provide but small Poles, lest you impoverish the Root, for the Hop will soon run it self out of heart, if over-poled: More especially, be sure not to over-pole Hops the first year of their Plantation, although they require as many Poles (or rather Rods) the first, as any other year.

You must be content with such Poles the Country you live in affords; *Alder* Poles are esteemed the best, because the Hop most willingly climbeth them, by reason of their streight and tapering Form, and also their rough Rinde, suffers not the Hop so easily to slip down.

But

But the *Asb* is esteemed the best for lasting, especially such that grow on dry and barren Lands of many years growth, which are known by the many Circles in the bottom: I have known such to have lasted ten or twelve years, the Wood being much harder, and more durable than the speedy grown Poles.

Some altogether reject forked Poles, and usually cut off the forked Branches, if any, because they cannot (as they pretend) so easily strip off the Hops at gathering-time: But I have known the greatest burthen of Hops on a forked Pole, and to have suffered less injury by the Winds when they have been fully blown; and that inconveniency of not stripping them, is easily remedied by our directions, as you will hereafter find.

Disperse the Poles among the Hills before you begin to Pole, laying of them between the Hills.

Begin not to Pole until your Hops appear above the ground, that you discern where the biggest Poles are required, and so may you continue Poling till they are a yard in height, or more; but stay not too long, lest you hinder the growth of the Hop, which will grow large, unless it hath a Pole or such-like, to climb unto.

Set the Pole near to the Hill, and in depth according to the height of the Pole, nature of the ground, and obviousness to Winds, that the Pole may rather break than rise out of the Ground by any fierce Winds.

Let the Poles lean outward the one from the other, that they may seem to stand equi-distant at the top, to prevent Houpling, as they term it, which they are subject unto if they grow too near the one to the other; that is, they will grow one amongst another, and cause so great a shade, that you will have more Hawm than Hops. Also it is esteemed an excellent piece of Husbandry to set all the Poles inclining towards the South, that the Sun may the better compass them. This is most evident, that a leaning or bending Pole bears more Hops than an upright.

Be sure to reserve a parcel of the worst Poles, that you may have for your need, in case when the Poles are laden, a Pole may break, or be over-burthened to support it; for if they lie on the ground they soon perish.

With a Rammer you may Ram the Earth at the outside of the Pole, for its further security against Winds.

If after some time of growing you find a Hop under or over-Poled, you may unwind the Hop, and place another Pole in its place, having a Companion with you to hold the Hop, whilst you pitch in the Pole; or else you may place another Pole near it, and bring the Hop from one Pole to the other.

The next work is after the Hops are gotten two or three feet out of the ground, to conduct them to such Poles as you think fit, that are either nearest, or have fewest Hops, and wind them or place them to the Pole, that they may wind with the course of the Sun, and bind them gently thereto with some withered Rush, or Woollen Yarn; Two or three strings are enough to a Pole: I have known more Hops on one Pole from one string, than on another from four or five, though this hath had more of Hawm.

Be cautious of breaking the tender Shoots, which in the morning is most dangerous; but when the warmth of the day hath toughened them, they are not so apt to break.

You must be daily amongst the Hops, during *April* and *May*, especially guiding and directing them, else they will be apt to break their own necks by going amiss: It will sufficiently require your labour and care at Harvest.

It is convenient with a forked Wand to direct the Hops to the Poles that are otherwise out of reach, or to have a stool to stand on, or a small Ladder made with a stay on the back of it, that you may reach them with your hands.

About *Midsummer*, or a little after, the Hop begins to leave running at length, and then begins to branch; such Hops that are not yet at the tops of the Poles, 'twere not amiss to nip off the top, or divert it from the Pole, that it may branch the better; which is much more for the increase of the Hop, than to extend it self only in length.

Of the making up the Hills.

Sometimes in *May* after a Rain, pare off the Surface of the ground with a Spade, Hoe it off with a Hoe, or run it over with a Plow with one Horse, if you have room enough, or with a Breast-Plow; and with these parings raise your Hills in height and breadth, burying and suppressing all superfluous Shoots of Hops and Weeds.

By this means you will destroy the Weeds that otherwise would beggar your Land, and you suppress such suckers and Weeds that would impoverish your Hops; & you also preserve the Hills moist by covering them, that the drought of the Summer injureth them not: Also the Hop, so far as it is covered with Earth, thrusts forth its root to the very surface of the Earth, which proves a very great succour to the Hop. This work may be continued throughout the Summer, but more especially after a Rain, to apply the moist Earth about the roots of the Hop.

Therefore it behoveth you to keep the ground in good heart, for this purpose, that your Hops may be the better; and in case it should prove a very dry Spring, it would not be amiss to water the Hops before you raise your Hills.

Manner of watering Hops.

A dry Spring, such that happened in the years 1672, and 1674, proves a great check to the Hop in its first springing, especially in hot and dry grounds. In such a case it is very advantageous to water them, if it can with conveniency be obtained, either from some Rivulet or Stream running through, or near your Hop Gardens, or from some Well digged there, or out of some Pond made with Clay in the lower part of your Ground, to receive hasty showers by small Aqueducts leading unto it, which is the best water of all for this purpose.

To give to the hills of iron down in the middle thereof, and pour in your water by degrees, till you think the Hill is well soaked, then cover the Hill with the parings of your Garden, as before we directed; which will set the Hop mainly forward, as I have shewn, which otherwise would be small and weak, and hardly ever recover to attain its usual height. Also a very hot and dry Summer will make the Hop blow but small and thin, therefore it would not be labour lost to bestow a pail of Water on every Hill prepared before hand to receive it.

For in such dry Springs or Summers, such Hops that either stand moist, or have been watered, do very much but strip their neighbours, and in such

such years they will far better requite your Labour and Industry, yielding a greater price by reason of their scarcity, than in other seasonable years, when every ground almost produceth Hops: Industry and Ingenuity in these Affairs, being most encouraged, and best rewarded, at such times when Ignorance and Sloth come off with Loss and Shame.

After every watering (which need not be above twice or thrice in the driest Summers, (so that they be thoroughly wet) be sure to make up the Hills with the parings, & with the weeds, and coolest & moistest materials you can get; for the more the Hop is shaded at the root from the Sun, the better it thrives, as is evident by such that grow under shelter that are never dressed, yet may compare with those you bestow most pains and skill on.

The dressing of your hops, and poling them, the directing and binding them to the Poles, the watering and making up the Hills throughout the Summer seems to be a tedious task, requiring daily attendance: but without these Labours little is to be gotten, which makes this Plantation so little made use of in some places; yet he that is diligent, and understands his business, is so highly requited for his Care, Cost, and Industry, that an Acre or two of ground so managed by one or two persons, shall redound one year with another to more advantage, than fifty Acres of Arable Land, where there is much more time, cost, and expence bestowed upon it.

Towards the end of *July* Hops Blow, and about the beginning of *August* they Bell, and are sometimes ripe in forward years, at the end of *August*, but commonly at the beginning of *September*.

When Hops
Blow, Bell,
and Ripen.

At such time as the Hop begins to change his colour, and look a little brownish, or that they are easily pulled to pieces, or that the Seeds begin to change their colour toward a brown, and they smell fragrantly, you may conclude them to be ripe, and procure what help is necessary for a quick dispatch, to gather them before they shatter, one windy day or night may otherwise do you much injury.

When to gather
Hops,
and the manner
how.

The manner usually prescribed for the gathering of Hops, is to take down four Hills standing together in the midst of your Garden; cut the Roots even with the ground, lay it level, and throw water on it, tread it and sweep it, so shall it be a fair Floor whereon the Hops must lye to be pickt.

On the outside of this Floor are the Pickers to sit and pick them into Baskets, the Hops being stript off the Poles, and brought into the Floor.

Some there are that sit dispersedly, and pick them into Baskets, after they are stript off the Poles.

Remember always to clear your Floor twice or thrice every day, and sweep it clean every such time before you go to work again.

In these ways of picking, it is necessary that the Poles be straight, without Forks, Scrags or Knobs.

But the best and most expeditious way is, to make a Frame with four short Poles or Sticks, laid on four Forks driven into the ground, of that breadth, to contain either the hair of your Oost or Kila, or a Blanket tacked round the same about the edges; on which Frame you may lay your Poles with the Hops on them, either supported with Forks or with the edges of the Frame; the Pickers may stand on each side and pick into it. When the Blanket or Hair is full, unstack it, carry it away, and place another, or the same emptied in the same Frame again: everyday you may

may remove your Frame with little trouble to some new place of your Garden near your Work.

This way is found to be most convenient, expeditious, and advantageous ; for it saves the labour of stripping the Haws of the Hops, off the Poles. Also any forked or Scraggy Poles which are best for the Hop, prove no impediment to this way of picking : It preserves the Hops from briting or shedding, which by stripping off the Poles, and wrapping them up in bundles to carry up and down, they are apt to do. Also this way they may pick them clean off the Poles as they hang, without tumbling and tearing, which causes much filth to mix with the Hops, besides the spoiling and loss of many Hops ; and being thus picked over your Frame, if the Hops be never so ripe, and subject to shatter, all is preserved. The Pickers may this way make more expedition than the other, the Hops hanging in view as they grow on the Poles.

Before you draw your Poles, with a sharp hook fixed at the end of a long stale or Pole, divide the Hops above, where they grow together with other Poles ; then ought you to cut the Hops, not as is usually prescribed and practised close at the Hills, but about two or three Foot above the Hills, else will the Hop bleed much of his strength away. This hath been found to be a great strengthener of weak Hops, the other a weakener to all.

Then draw your Poles, which in case they are so far or fast in the ground, that you cannot raise them without breaking of them, you must get a pair of Tongs made like unto a Blacksmiths Tongs, only stronger, and toothed at the end, with which Tongs you may beclip the Pole at the bottom, and resting the joyn thereof on a block of Wood, you may weigh up the Pole without trouble or danger of breaking the Pole : or for cheapness sake, you may have a wooden Leaver forked at the end, in which Fork fix two sides of sharp and toothed Iron ; which put to the Pole, and on a block of wood as before, you may heave up the Pole by the strength of your right hand, whilst you pull the Pole to you with your left.

Cut no more stalks, nor draw no more than you can conveniently dispatch in an hour or two, in case the weather be very hot, or it be likely to Rain.

If your Hop-Garden be large, it were worth your cost and pains to raise in the midst thereof a Shed, or such-like House, on four or six main Forks or Posts, and Thatched over, under which shelter you may pick your Hops ; which will both defend your Pickers from the Sun, and your Hops from the Sun and Storms. Herein may you lay a parcel of Hops unpicked over night, that your Pickers may to work in the next morning, before the Dew be off the other that are abroad : or in case a storm comes, you may lay in here enough to serve till the other are dry again. And under this shelter may your Poles lie dry all the Winter.

Let not your Hops be wet when you gather them ; but if the Dew be on them, or a Shower hath taken them, shake the Pole, and they will be dry the sooner.

If your Hops be over-ripe, they will be apt to shed their Seed, where in consisteth the chiefest strength of the Hop. Also they will not look so green, but somewhat brown, which much diminisheth the value of them ; yet some let them stand as long as they can, because they waste less in the

the drying ; four pounds of undried Hops, through ripe will make one of dry ; and five pounds of Hops scarcely ripe, yet in their prime, makes but one : so they judge they get more in the through-ripe-Hop by the weight, than they loose in the colour.

There are also two sorts of Hops, the Green and the Brown ; the one yielding a better colour by much when they are dry ; the other bears larger, and a greater quantity of Hops, which is rather to be preferred.

In the picking keep them as clean as you can from Leaves and Stalks, which will damage you more in the Sale, than they will advantage you in the weight.

As fast as you pick them dry them, for their lying undried heats ^{of the dry-} them, and changes their colour, very much to the damage of the Hop : ^{ing of Hops.} but if your Kiln be full, and that you must keep your Hops awhile, then spread them on some Floor, that they may not lye too thick ; and thus will they keep a day or two without much damage.

Well drying of Hops, is the most necessary thing to be taken care of ; for if that be not rightly done, they are not fit for the Market, nor for use ; for a handfull of slack-dried Hops will mar and spoil many pounds, taking away their pleasant scent and colour ; therefore let your Hops be thoroughly and evenly dried ; which to accomplish, there are several ways made use of, some whereof that are most useful and necessary, I shall here discover.

This following Description we find to be used by the *Flemmings* or *Hollanders* ; and also at *Poppering*. ^{Description of an Oost or Kiln.}

First, make the square Room or Kiln above eight or ten Foot wide, according as you desire it to be in bigness, built up with Brick or Stone, with a Door-place at one side thereof.

In the midst of this Room on the Floor, must the Fire-place be made, about thirteen Inches wide within, and about thirteen Inches high in length from the mouth thereof, almost to the back part of the Kiln or Oost, leaving only a way for a man to go round the end of it ; it is usually called a Horse, and is commonly made in Mault-Kilns, the Fire passing out at holes on each side, and at the end thereof ; and needs no farther description, every Mason or Bricklayer almost is acquainted with it.

About five Foot high is placed the Bed or Floor, whereon the Hops lye to be dried, which must have a Wall about it four Foot high, to keep the Hops up from falling. At the one side of the upper Bed must be made a Window, to shove off the dried Hops down into the Room prepared for them.

The Bed must be made of Laths or Rails sawn very even, an Inch square, and laid a quarter of an Inch asunder, with a cross-beam to support them in the middle ; into which Beam the Laths are to be let in even with the top of it, which keeps the Laths even in their places.

On this Bed without any Oost-cloth, lay your Hops by Basket-fulls, beginning at the one end, and so proceeding till all be covered about half a yard thick, without treading on them ; then lay them even with a Rake or Stick, that they may not lye thicker in one place than in another.

Then

Then make your Fire below of broken Poles, or other Wood, lay our Authors : But Charcoal is the only fewel for Hops, not in any wise diminishing the colour, which smoaky Wood or Brands will do.

You must keep your Fire at a constant heat, and only at the mouth of the Furnice, for the Air will disperse it sufficiently.

The Hops this way are not to be stirred until they are thoroughly dried, which is not until the top are dry as well as the bottom ; but if any place be not so dry as the rest, (which you may perceive by reaching over them with a Stick or Wand, and touching them in several places, observing where they rattle, and where not) then abate them there, and dispose of them where the places were first dry.

When they are through-dry, which is known by the brittleness of the inner stalk, if rubbed, and it break short, then are they enough ; then take out the Fire, and shove out the Hops at the window for that purpose, with a Coal-rake made of a board at the end of a Pole, into the room made to receive them ; then go in at the door below, and sweep together the Seeds and Hops that fell through, and lay them with the other.

Then proceed to lay another Bed of Green Hops, as before, and renew the Fire.

*Another way
to dry Hops.*

In several places they dry their Hops on the ordinary Malt kilns on a Hair-cloth, laying them about six Inches thick ; and when they are almost dry, with a Scoop made for that purpose, they turn them upside down, and let them lie again till every Hop as near as they can, be thoroughly dried ; and then with the Hair-cloth remove them to the heap, where they are to lie till they are Bagged.

Both these ways are subject to several inconveniencies : In the first way the Hops lying so thick, and never turned, the under-part of them must needs be dry long before the upper ; and the Fire passing through the whole Bed to dry the uppermost Hop, must needs over-dry, and much injure and waste the greater part of the Hops, both in strength and in weight, besides the waste of Firing, which must be long continued to through-dry so many together.

In the second way, the turning of the Hops breaks them very much, by forcing of the Scoop among the rough Hair-cloth, frets and spoils many Hops, and shatters their Seeds, else this way is rather to be preferred above the other.

*The best way
to dry Hops.*

Which several inconveniencies may be removed and prevented, by making the lower part of the Kiln as before is described, and the Bed thereof made after the following manner : First, make a Bed of flat ledges about an Inch thick, and two or three Inches broad, sawn, and laid across on the other, Checquerwise, the flat way, the distances about three or four Inches, the ledges so entred the one into the other, that the Floor may be even and smooth : this Bed may rest on two or three Joyces set edge-wise to support it from sinking.

Then cover this Bed with large double Tin, soudred together at each joynt ; and so order the ledges before you lay them, that the joynts of the Tin may always lie over the middle of a ledge ; and when the Bed is wholly covered with Tin, fit boards about the edges of the Kiln to keep up the Hops, only let the one side be to remove, that the Hops may be shoved off, as before.

On this Tin-Floor or bed may the Hops be turned without such hazard or loss as before on the hair, and with less expence of Fuel: Also any manner of Fuel will serve for this purpose as well as Charcoal, the smoak not passing through the Hops, as in either of the other ways: but you must remember to make Conveyances for it at the several corners and sides of your Kiln or Oost.

Only the saving of Fuel, besides the advantage your Hops receive, will of it self in a little time recompence the charge extraordinary in making the Tin-Floor.

The turning of Hops after the most facile and secure way is yet found to be not only a waste and injury of the Hop, but also an expence of few-^{To dry Hops suddenly, without turning them.} el and time, because they require as much fuel, and as long time to dry a small part when they are turned, as if they were almost all to be dried; which may be prevented, in case the upper-bed whereon the Hops lye have a Cover that may be let down and raised at pleasure; which Cover may be tinned over, only by nailing single Tinn over the face of it, that when the Hops begin to dry, and ready to turn, that is, that the greatest part of the moisture is evaporated away, then may you let down this Cover within a Foot or less of the Hops, which (Reverberatory-like) will reflect the heat upon them, that the uppermost Hop will soon be as dry as the lower, and every Hop equally dried.

This is the most expeditious, most sure, and least expensive way that can be imagined to dry Hops, which is one of the costliest, troublesome, and most hazardous piece of work that belongs to the Hop, as it is vulgarly used.

As soon as your Hops are off the Kiln, bag them not immediately, but lay them in some room or place, that they may lye three or four weeks^{Bagging of Hops.} or more, that they may cool, agive, and toughen; for if they are immediately bagged, they will break to a Powder, but if they lye a while (the longer the better, so they be close covered from the Air with Blankets) you may Pack or Bag them with more security.

The manner whereof is usually thus; make a hole round or square in an upper Floor big enough, that a man may with ease go up and down and turn and wind in it; then tack on a Hoop about the mouth of the Bag fast with Packthread, that it may bear the weight of the Hops when full, and of the man that treads them; then let the Bag down through the hole, and the Hoop will rest above, and keep the Bag from sliding wholly through: Into which Bag cast a few Hops, and before you go in to tread, tye at each lower corner a handfull of Hops with a piece of Packthread, to make as it were a Tassel, by which you may conveniently lift or remove the Bag when it is full; then go into the Bag, and tread the Hops on every side, another casting still in as fast as you require them, till it be full: When it is well trodden and filled, let down the Bag by unripping the Hoop, and close the mouth of the Bag, filling the two upper corners as you did the two lower.

Which Bag, if well dried and well packed, may be preserved in a dry place several years; but beware lest the Mice destroy and spoil them.

After you have dried and laid by your Hops, you may return again to the Hop-Garden, and take care to preserve the Poles for another^{Laying up the Poles.} year.

Strip off the Hawm clean from them, and set up three Poles (like unto a Triangle, wherewith they usually weigh heavy Ware) spreading at the bottom, and bound together near the top, about which you may set your Poles as many as you please; bind them about with a little Hawm twisted, to keep them together: by this means the outward Poles are only subject to the injuries of the weather, which keep all the inner Poles dry, except only the tops, which for the most part are exposed to the Air and Wet.

Therefore most Pile them up at length in Piles in several places of the Hop-garden, by pitching in several Poles on each side the Pile, and laying two or three old Poles athwart at the bottom to keep them from the moist ground, and so lay the Poles that the smaller ends may be inwards, and the bigger ends outwards; for which purpose the Pile must be somewhat longer than the Poles; and when you have raised them high enough, with Ropes of Hawm, bind the Poles that stand on the one side overthwart to the Poles on the other, to preserve them upright, and cover them with Hawm to defend them against the Rain.

But the better way is to lay them in such Shed or House erected in your Hop-Garden, which may serve for picking of Hops there in the Summer, and preservation of the Poles in the Winter: it will soon requite your Cost.

*Dunging or
Soiling of the
Hop-Garden.*

In the Winter, when little else can be done to the Hop-garden, then may you provide Soil and Manure against the Spring; if the Dung you carry in be rotten, then mix it with two or three parts of the common Earth, and so let it ly well mixed till the Spring, which will serve to make up the Hills withall.

But if the Dung or Soyl be new, then let it lye mixed till another year, for new dung is very injurious to Hops.

Horse Dung, Cow-Dung, or Oxe-Dung are very good, but no Dung is to compare with Pigeons-Dung, a little thereof only to a hill, and mixed, that it may not be too hot in a place: Sheeps-dung is also very good.

In the Spring or Summer-time, if you steep Sheeps-dung, Pigeons-dung, or Hen-dung in water, till it be quite dissolved; and when you water your Hops on the top of every hill, in the Hollow place made to contain the water, you may put a dishfull of this dissolved dung, and the water wherewith you water your Hops will carry with it the vertue thereof to the roots of the Hop, which may prove the most expeditious, advantagious, and least expensive way of enriching the Hop-hills of any other.

Also by this means you may convey to the Roots of Hops, or any other Plant, the fixed Salt or vertue of Lime, Ashes, or any other Fertilizing or enriching Subject whatsoever, whereof we have already discoursed.

S E C T. II.

Of Liquorice, Saffron, Madder, and Dyer's Weed.

Of Liquorice.

The Land this Plant principally delights in, being not every where to be had, is one of the causes it is so much neglected, and the method of Planting

Planting and ordering of it so little understood: although our English Liquorice exceeds any Forreign whatsoever, yet have not we enough Planted, but yearly buy of other Nations.

It much delights in a dry and warm Land, light and mellow, and very deep: for in the length of the Root consists the greatest advantage; for if it be not light, dry and deep, the Roots cannot enlarge freely such Land that Carrots, Parsnips, &c. delight in, Liquorice will prosper in it: If the ground be not very rich of it self, you must mix good store of the best and lightest Soil in the digging; it must be trenched very deep, at the least three Spades deep, in case the Mould will bear it, and lay it as light as possible you can. The best way is to dig it with the Dung at the beginning of the Winter, and then dig it again at Planting-time, which will lay it much the lighter, and mix the Dung the better.

Procure your Sets from the best and largest Liquorice; the best Sets are the Crown-sets, or heads got from the very top of the Root. Next, and nearest good are the Runners, which spread from the Master-roots, and have little Sprouts and Roots which will make excellent Sets, being cut about four or five inches long. The Branches also may be slipped and planted; if it prove moist weather, they will many of them grow; these may serve to thicken where they are too thin.

The usual and best time for the planting of Liquorice, is in February and March; about a Foot distance is usuall to plant your Sets in Rows by a Line, in holes made with a Setting stick, steep enough to contain the Plant, which as soon as it is in the hole, Earth it up; and if they prove dry, water them as soon as they are set, and so for several days, untill they have recovered their witheredness. The First year you may sow the ground with Onions, Lettice, or such like herbs.

Then afterwards they must be kept Hawed every year, till they are taken up.

The Sets are impatient of being Planted, after they are once out of the ground; therefore use what expedition you can, and Earth them up if you carry them far, and be sure to have the ground ready before the Sets.

After it hath stood three Summers in the ground, you may dig it up about the Month of November or December; for then it weighs most, and will keep best without loss for some time. It is best to dispose of it whilst it is new and green, because it will much decay in its weight.

Some that have very good Liquorish have gained much by it, the better the Land is, the more is the advantage: There hath been made from fifty pound to an hundred pound of an Acre, as some affirm.

Pontefract in Yorkshire is the most noted place for this Plant that I have heard of: Next unto that, Godalming in Surry deserves to be remembered also, for the Industry of the Inhabitants in Propagating this necessary Plant: The long continuance of the Planting wherof in those places, to the so great advantage of the Inhabitants, is an Argument sufficient of the improvement it makes, there being in many other places as good Land for this purpose as either of those places afford.

English Saffron is esteemed the best in the world, its a Plant very suitable to our Climate and Soil; therefore it is our negligence that it is no more Propagated: It delights in a good dry found Land, brought into perfect Tillage by Manure and good Husbandry; the better your Land

Time and
manner of
planting of it.

is, the better may you expect your Crop. About *Midsummer* it is to be Planted, some say about *March*; it is increased by the Roots, which yearly multiply in the ground, like unto other Bulbous Roots, or rather more. They are to be taken up, and new Planted usually once in three years, and then may many of the Roots be obtained. They are set in Ranges two or three Inches deep, and about two or three Inches asunder, but the Ranges about four or five Inches apart, for the more convenient Weeding or Hawing of them.

Time of the
flowering and
gathering of
Saffron.

About *September* the Flower appears like a blew *Crocus*, and in the middle of it comes up two or three *Chives* which grow upright together, and the rest of the Flower spreads abroad; which *Chives* being the very *Saffron*, and no more, you may gather betwixt your fingers, and reserve it. This must be done early in the morning, else it returns into the body of the Flower again; and so for about a Months space you may gather *Saffron*. You must procure many hands, according to the quantity of your ground; you may gather two or three Crops, and then remove it. After it hath done Flowering, it remains green all the Winter.

Drying of
Saffron.

Care must be also taken in the drying of it, which may be done in a small Kiln made of Clay, and with a very little Fire, and that with carefull attendance; three Pounds thereof moist usually making one of dry.

Profits of
Saffron.

One Acre may bear from seven to fifteen Pound, and hath been sold from twenty shillings a Pound to five Pounds a Pound, and may cost about four Pound *per* Acre the management thereof; which gives a very considerable Improvement and Advantage.

Of Madder.

Madder is esteemed by some to be a very rich Commodity, and worthy our care and cost to Propagate, it being so much used by *Dyers* in the Dying of their red colours, and in so great request of the *Apothecaries* for Medicinal uses; and a Plant also that delights in our Climate.

Land fit for
Madder.

It is to be Planted in a very rich, deep, warm, and well-manured Land, digged at least two or three Spade graft deep.

Time and
manner of
planting it.

Then about *March* or *April*, as soon as it springs out of the ground, is it to be Planted: the sets are to be gathered two or three Inches long, with Roots to them, and immediately Planted (or put into Mould, if carried far) and then set about a Foot apart the one from the other, and keep water'd till the Spring, and continually Weeded, till they have got the Mastery of the Weeds.

The use and
profit of
Madder.

At three years end, you may take it up; reserve the Plants for your own use, and sell the Roots to the *Apothecaries*, or dry them for the *Dyers* use: But the description and manner of drying and Milling thereof for that purpose, I leave to those that are better experienced therein, or until I have obtained some light thereinto. The great advantage that it brings to the Planter, according as it is by some related, is Incouragement sufficient to any ingenious man to make a farther enquiry and progress into its Nature and Method of ordering it.

Of Weld, or
Dyers-Weed,
what Land it
requires,

Weld or *Dyers-Weed* is a rich *Dyers* Commodity; it groweth in many places wild, and is sown also in many places in *Kent* to a very great advantage: it will grow on any ordinary or Barren Land, so that it be dry and warm.

Manner of
sowing it.

It may be sown on Barley or Oats after they are sown and harrowed, this requiring only a Bush to be drawn over it: A Gallon of Seed will sow

low an Acre, it being very small, and is best to be mixed with some other material, as before we advised concerning *Clover-grass-seed*: It groweth not much the first Summer; but after the Corn is gathered it is to be preserved, and the next Summer you shall receive your Crop.

You must be very cautious in the gathering of it, that the Seed be not over-ripe, for then it will fall out: if not enough, neither Seed nor Stalk will be good: It is to be pulled as they do Flax, by the Roots, and bound up in little handfuls, and set to dry and then Houled: Then may you beat or lash out the Seed, which is of good value, and dispose of the Stalk and Root to the Dyer, which is of singular use for the Dying of the bright *Yellow and Lemon Colour*.

Gathering & ordering it.

S. E. C. T. I. II.

Of Beans, Pease, Melons, Cucumbers, Asparagus, Cabbage, and several other sorts of Garden-Tillage.

The several sorts of Garden-Tillage hereafter Treated of, are some of them used for second Courses, and others of them for Sawces, which raiseth an objection that they are unprofitable; which (although it be sometimes urged by the ignorant) is very frivolous, if you consider, That at such Tables where is the greatest Plenty, Garden-Tillage is as acceptable as Flesh-meats; and if it be only a Sawce, yet it helps to fill the Belly, and in part supplies the place of Bread: And at other tables, where Frugality is used, a Dish of good Tillage with a little Flesh meat satisfies Nature as well as all Flesh would do, and with much less expence of Bread: So that we may very well conclude, That the greater part of Garden-Tillage is very advantageous to the Common Weal in general.

First, in that it is very good and wholsom Diet, more satisfactory than all Bread, and more wholsom than all Flesh.

Secondly, it is a cheaper Food than either Bread or Flesh: For an Acre of Ground will yield far more of Tillage, than of Corn, which is cheaper than Flesh.

Thirdly, it employs more hands in the raising of it.

Fourthly, Tillage is not so hazardous, or subject to be spoiled by the various mutations of the Air, or by *Blight, Mildews, &c.*

Therefore let the Nation increase in People as much as it will, Tillage may be so increased, as that there can be no fear of scarcity of Provision: for it is not difficult to demonstrate that ten times more People than now are in this Kingdom may plentifully be sustained by the productions of the Earth, &c.

Of Beans in general we have already discoursed in this Treatise: only here, as it falls in our way we shall say a little concerning the greater sort of Garden-beans, which you Plant only for the Table: They delight in a rich stiff Land, or a Land newly broken up: They are usually set between *St. Andrews day* and *Christmas*, at the Wane of the Moon: But if it happen to freeze hard after your Beans are sowed, it will go near to kill them all; therefore it is the surest way to stay till the greatest Frosts are over, untill after *Candlemass*. It is a general Error to set them promiscuously, and too near together, when it is most evident that being set, or otherwise Planted in Rows, by a Line they bear much more the

Garden-Beans.

Sum

Sun and *Air* having a more free Passage between them: Also you may the better go between them to the Weed, Top, or Gather them: And you may sow Carrots in the Intervals, which after the Stalks are drawn up, will prove a good second Crop. Let the Ranges run from *South* to *North*, for the greater advantage of the *Sun*.

If you Sow or Plant them in the *Spring*, steep them two or three days in fat water, as before is prescribed for the steeping of Corn; it is better to *Haw* them in, than to set them with *Sticks*, the usual way. In the gathering of Green Beans for the table, the best way is to cut them off with a Knife, and not, as is usual, to strip them down, for that wound prevents the prosperity of the younger Cods, not yet ripe: When you have gathered your early Beans, then cut off the Stalks near the ground, and you may probably have a second Crop ere the Winter approacheth. These larger sort of Beans yield a far greater encrease than the ordintry sort; therefore it is great pity they are no more propagated in the Fields than they are, especially where the ground is rich.

Of Pease.

There are several sorts of Garden-Pease sown or planted in this Kingdom, some approved of for their being early ripe, and some for their pleasant taste; others for their being late ripe, succeeding the other: The Hot-Spurs are ripe the soonest, from their time of sowing, of any other; then succeeds the large white Pease, and several other sorts of green, grey, and white Pease; then the large white Hasting, and great grey Rouncival Pease. There is also another sort of Pease in some places, usually called the Sugar-Pease for their sweetness; they are to be eaten in their Cods, which grow crooked and uneven; their extraordinary sweetness makes them liable to be devoured by the Birds, unless you take great care to prevent them. These are sown later than the other, by reason of their tenderness.

A fat rich Garden Mould yields the largest Pease; but a light, warm, and ordinary Soyl yields the tenderest and sweetest.

If you would have the earliest Pease, sow them in *September* or *October*, that they may get some Head before the Frosts take them; and then with due care may they be preserved over the Winter, and will bear very early. To have them very late, sow them a little before *Midsummer*, and so may you have Pease in *September*.

As for the manner of sowing, it is divers; some sow at random, as they sow Corn; which is altogether to be disapproved of, because they cannot be so evenly dispersed, nor at so equal a depth, as in the other ways: Others set them in Ranges with a Dibble or Setting-stick: which is a very excellent way both to save Pease, and to give liberty to pass between for the *Hawing*, *Gathering*, &c. But that which is most used, and best approved of, is the *Hawing* of them in, which makes a quick ridance of the work, and covers all at a certain depth, and doth not sadden or harden the ground as setting doth.

It is good to make the Ranges at some reasonable distance that you may the more conveniently pass between them to *Haw* the Weeds and Earth up the Roots in the *Spring*: for the nakedness and barrenness of the ground adds much to the maturation of the Pease, by the reflection of the *Sun*; and the laying up the earth at the Root, preserves them much from Drought.

Where your ground is small, or that you can easily furnish your self with *sticks*, they will yield a great encrease if they have *sticks* to climb on.

on. But this, and several other ways of ordering them, we leave to the pleasure and skill of every one, whose curiosity and delight is exercised in such affairs.

Of all the sorts of *Codware*, there is none so fruitfull, nor multiplies so much, as doth the *French* or *Kidney-Bean*; being a very pleasant curious and wholsom Food, and deserves a greater place and proportion of Land in our Farm than is usually given it: It is a Plant lately brought into use among us, and not yet sufficiently known; the greatest impediment to its farther Propagation, is the tenderness of it at its first springing, & the sweetness of it, which makes it more liable to be devoured by Snails, Worms, &c. But a little care and industry bestowed about them will be plentifully recompenced in the fruitfull Crop; the several uses whereof, as well for the *Kitchen*, as for the feeding of *Beasts* and *Fowl*, are not yet commonly known or practised.

Of French-Beans.

These being meerly Fruits raised for our pleasure in the Summer-time, and not of any general use or advantage to the Husbandman, we shall therefore pass them by, only as to the ordering of the ground. For the setting and raising them early, see more at the end of this Chapter.

Of Melons & Cucumbers.

The best way for the raising of *Pompions*, is to Plant the Seeds first in a good Mould, in a warm place, and then to transplant them into a rich dungy Bed made for that purpose, watering them now and then with water wherein Pigeons-dung hath been infused; then take away, about blossoming time, all the by-shots, leaving only one or two main Runners at the most, and so shall you have them grow to an huge bigness. Take heed you hurt not the heads of the main Runners.

Of Pompions.

The *Artichok* is one of the most excellent Fruits of the *Kitchen-garden*, of *Artichoks*, and recommended not only for its goodness, and the divers manners of *Cooking* of it, but also for that the Fruit continues in season a long time.

The ground is to be very well prepared, and mixed several times with good Dung, and that very deep: The *Slips* that grow by the sides of the old *Stubs* serve for Plants, which are to be taken and planted about *April*, when the great *Frosts* are over, and kept watered till they are firmly rooted; and if they be strong, they will bear heads the *Autumn* following. They are to be Planted four or five Foot distance the one from the other, if the Soil be rich; but if it be not, then nearer. After the *Planting*, they need no other Culture before winter, save only Weeding, and Dressing sometimes, and a little Water if the Spring be dry.

Against the *Winter*, before the great *Frosts*, they are to be preserved against them: Some cut the Leaves within a foot of the ground, and raise the Earth about them in manner of a Mole-hill, within two or three inches of the top, and then cover it with *Long-dung*; which both preserves them from *Frosts*, and keeps the Rain from rotting them.

Preservation against Frosts.

Others put *Long-dung* about the Plants, leaving the Plant a little Breath-room in the middle, which will do very well.

Others prescribe them to be covered with an *Earthen-pot*, with a hole at the top; but a Bee-hive is to be preferred before it.

The way now most used, is to cut off their Leaves about *November*, and cover them all over with Earth, and so let them lye till the Spring.

It

Dressing *Ar-*
tichocks.

It is not good to *Earth* them too soon, lest it rot them.

The *Winter* spent, you shall uncover your *Artichocks* by little and little, at three several times, with about four days interval each time, lest the cold *Air* spoil them, being yet tender; you shall then *dress, dig about, and trim* them very well, discharging them from most of their small Slips, not leaving above three of the strongest to each foot for Bearers, and give a supply to the Roots as deep as conveniently you can of good fat Mould.

It will be good to renew your whole Plantation of *Artichocks* every *fifth* year, because the Plant impoverishes the Earth, and produces but small Fruit. Yet in good deep Land they will last Ten or Fifteen Years.

If you desire to have *Fruit* in *Autumn*, you need only cut the Stem of such as have born Fruit in the Spring to hinder them from a second Shoot, and in *Autumn* these lusty Stocks will not fail of bearing very fair Heads, provided that you dress and dig about them well, and water them in their necessity, taking away the Slips that grow to their sides, and which draw all the substance from the Plants.

Of *Aspara-*
gus.

The *Asparagus* seems to contend for Preheminence with any of the *Garden-Plants* for the Kitchen, being so delicate and wholesome a food, coming so early, and continuing so long, as to usher in many other of the best Rarities.

Planting of
them.

They are raised of Seeds in a good fat Soil, and at two years growth may be transplanted into Beds.

Which must be well prepared with Dung, first digging about two foot deep, and four foot wide, made level at the bottom; and so mix very good rotten Dung with some of the Mould, and fill them up, considering that it will sink: Then Plant your *Asparagus-Plants* at about two foot distance; you may Plant three or four Rows in this bed of four foot wide, they will in time extend themselves throughout all the Bed.

Some curious persons put *Rams-horns* at the bottom of the Trench, and hold for certain, That they have a kind of Sympathy with *Asparagus*, which makes them prosper the better; but this is referred to the Experienced.

Ordering and
cutting them.

Three years you must forbear to cut, that the Plant may be strong, not stubbed, for otherwise they will prove but small; but if you spare them four or five years, you will have them as big as Leeks.

The small ones you may leave, that the Roots may grow bigger, permitting those that spring up about the end of the Season in every Bed to run to Seed: and this will exceedingly repair the hurt which you may have done to your Plants in reaping their Fruit.

At the beginning of the Winter, after you have cut away the Stalks, cover the Bed four or five fingers thick with new Horse-dung: Some prescribe with Earth four fingers thick, & over that two fingers of old dung, which will preserve them from the Frost.

At the Spring about the middle of *March*, uncover the Beds, and take of good fat Mould & spread over them, about two or three fingers thick, and lay your Dung in the Alleys, or elsewhere, which will rot, and be fit to renew the Mould the next Spring.

Early *Aspa-*
ragus.

If you take up the old Roots of *Asparagus* about the beginning of *February*, and Plant them on a hot Bed, and well defend them from *Frosts*,

Frosts, you may have *Asparagus* at *Candlemas*, which is yearly experimented by some.

When you cut *Asparagus*, remove a little of the Earth from about them, lest you wound the others which are ready to peep: cut them as low as you can conveniently, but take heed of hurting those that lye hid.

There are divers sorts of this most pleasant and delicious Fruit, and not *Strawberries*, any of them but are worthy of our care, and that little pains they require in Nursing them up.

The greater sort delight in a new broken Bed, or at least in such places where they have not grown before: They must be kept stringed, and removed every two or three years, & then will yield a very great encrease: They delight most in warm sandy Soyl: the best Plants are said to be such as come of the Strings; they bear best in the shade.

The white Strawberry, and the ordinary red, may be either Planted in Beds, or on the sides of the Banks, at your pleasure.

The ordinary red grows plentifully in the new-fallen Copses, from whence if you take your Plants about *August*, you will have a very fair encrease.

There is a sort of green Strawberry (though not usual) that lyes on the ground under the tall and slender leaves, exceeding sweet in taste, and of a very green colour.

Also there is another sort of Strawberry of a very excellent *Scarlet-Colour*, and most pleasant taste, that grows plentifully in *New-England*, and will prosper very well with us, as is experienced by a Merchant at *Clapham* near *London*, who hath many of them growing in his Garden.

To preserve them over the Winter (though they seldom dye) you strow a little Straw, Litter, Fern, or such like over them.

To have Strawberries in *Autumn*, you may only cut away the first blossoms which they put forth, and hinder their bearing in the *Spring*, and they will afterwards blow anew, and bear in their latter season: I have gathered many on *Michaelmas*-day. *Late Strawberry.*

As soon as your Strawberries have done bearing, cut them down to the ground; and as often as they spire, crop them, till toward the *Spring*: When you would have them proceed towards bearing, now and then as you cut them, strow the fine Powder of dried *Cow-dung* (or *Pigeons-dung*, or *Sheeps-dung*, &c.) upon them, and water them when there is cause. *Large Strawberry.*

The *Cole-flower* is an excellent Plant, and deserves a place in the *Kitchen-garden*; their seeds are brought out of *Italy*, and the Italians receive it from *Candia*, and other of the *Levantine* parts, which is the best, and produces the largest Heads. *Cole-flower.*

You may either sow the seeds in *August*, and carefully preserve them over the Winter, or you may raise them in your hot Beds at the *Spring*, and remove them when they have indifferent large leaves into good Land prepared for that purpose; but the best way is to dig small Pits, and fill them with good rich light Mould, and therein Plant your *Cole-flower*, which must be carefully watered.

There are divers sorts of *Cabbages*, and of several colour and forms; but we shall here take notice of no more then the ordinary *Cabbage* and *Colewort*, being sufficient for our Country *Kitchen*. *Cabbage and Colewort.*

The Seed is to be sown between *Midsummer* and *Michaelmas*, that it may gain strength to defend it self against the violence of the *Winter*;

which nevertheless it can hardly do in some years : or you may raise them on a hot Bed in the *Spring*.

In *April*, or about that time, they are to be transplanted into a very rich and well-stirred Mould ; if you expect the largest *Cabbages*, they delight most in a warm and light Soil, and require daily watering till they have taken Root,

In any ordinary ground, being well digged and wrought, may you raise great quantities of ordinary *Cabbages* and *Coleworts*.

If you intend to reserve the Seed, let it be of your best *Cabbages*, placed low in the ground during the *Winter*, to preserve them from the great Frosts and cold Winds ; cover them with *Earthen-pots*, and warm Soil over the Pots, and at *Spring* Plant them forth.

Savoy.

There is another sort of Cabbage, commonly called the *Savoy*, being somewhat sweeter and earlier than the common Cabbage ; and therefore to be preferred : It is raised and planted as the other, as also is the small *Dutch Cabbage*.

Lettice.

This is so common a Sallet-herb either raw or boiled, and the way of Propagating thereof so easy, that I may the better pass it by.

Only if you have a desire to have them white, or *blanch* them (as the French term it) then when they are headed or loaved in a fair day, when the Dew is vanished, bind them about with long straw, or raw Hemp ; or more speedily, you may cover every Plant with a small *Earthen-pot*, and lay some hot Soil upon them, and thus they will quickly become white.

Of Beets.

This ordinary Plant is by several made use of ; it loves a fat and rich Soil ; it's usually sown in the *Spring*, and will come up several years in the same ground, and may be Planted forth as *Cabbages* are.

Of Anise.

Aniseeds may be Propagated in *England*, as some have already experienced, by sowing them in *February*, between the Full and Change of the Moon ; then strow new Horse-dung upon them, to defend them from the Frosts. These will ripen about *Bartholomew-tide* ; then also may you sow again for the next year.

Let your ground be well stirred about *Michaelmas*, for that which you sow in *February* ; the black rich mellow ground is the best.

S E C T. III.

Of Carrots, Turneps, and other Roots usefull in the Kitchen.

Of Carrots.

Carrots are the most Universal & necessary Roots this Country affords, only they will not prosper in every ground ; they principally delight in a warm light or Sandy Soil ; or if Planted in other, it must be well stirred and manured : but if the ground be naturally warm and light, though but indifferently fertile, yet will they thrive therein : It is usual to sow them in the Intervals between the Beans, in digged not in Ploughed Land, because of extending their Roots downwards : After the Beans are gone, they become a second Crop ; the best are for the Table, the other for the feeding or fattening of Swine, Geese, &c. some of the fairest laid up in reasonable dry Sand will keep throughout the Winter. The fairest

fairest of them may you reserve till the Spring, and Plant them for Seed.

As to the generall way of Propagating Turneps we have already given you a hint; therefore have we little more to say, but that for your Kitchen use you may sow them at severall times; and if the Weather, the Birds, or the Worm destroy them; you may renew your labour and cost for a small matter. After they are in their Prime, you must House them from the Frost, by laying them in your Celler, or such like place, on Heaps.

Turneps.

The Parsnip is an excellent sweet Root, and very pleasing to some People; it is to be sown in the Spring, in a rich, mellow, and well stirred Soil. When they are grown to any bigness, tread down the tops, which will make the Roots grow the larger: the like may be done to Carrots, Turneps, or any other Roots. Towards the Winter, when you raise them, they may be disposed of in Sand, to be preserved as Carrots, Turneps, &c. The fairest may be kept for Seed, as before of Carrots; and then take the fairest and tallest tops of those Seeds in the Summer, and sow them, and by this means you may attain the fairest Roots.

Parsneps.

The Skirret is sweeter than any of the former Roots: they delight in a very fat and light Mould, and are raised of the slips, being planted in the Spring time in Ranges, about five or six inches asunder: at the winter when you raise the Roots, you may lay the tops in Earth till the Spring, for your farther encrease.

Of Skirrets.

Radishes are so commonly known, and their Propagation so easie, that there needs no more to be said about them.

Of Radishes.

Potatoes are very usual in Forreign parts, and are Planted in several places of this Country to a very good advantage; they are easily encreased, by cutting the Roots in several pieces, each piece growing as well as the whole Root; they require a good fat Garden mould, but will grow indifferently well in any: they are commonly eaten either Buttered, or in Milk. I do not hear that it hath been as yet essayed, whether they may not be Propagated in great quantities for food for Swine or other Cattle.

Of Potatoes.

Jerusalem Artichokes are near of the Nature of the Potatoes, but not so good, nor so wholesome, but may probably be propagated in great quantities, and prove good food for Swine. They are either Planted of the Roots, or of Seeds.

Of Jerusalem Artichokes.

Onions are Roots very much in request for their severall and diverse uses they are put unto in the Kitchen; they delight in a fine fat and warm Mould, and are to be sown in March, or soon after; but if you sow them sooner, you must cover them at the first: Where they come up too thick, they may be drawn and planted where they are thinner: when they are grown to some reasonable bigness, you ought to bend down, or tread the Spindle or Stalk, which will make the Head the larger: being sown with Bay-Salt, they have prospered exceeding well. In August they are usually ripe; then are they to be taken up and dried in the Sun, and reserved for use, in places rather dry than moist.

Of Onions.

This is so Universally known and propagated, that I need say little of it: If set in rich ground, it encreases to admiration, and may be Annually multiplied without hazzard of weather: keeping down the leaves makes the Root large.

Of Garlic.

of Leeks.

They are sown as the *Onions*, and afterwards it is best to transplant them deep, that they may have a great deal of *White stalk*, one such *Leek* being worth two others.

The fairest and biggest of *Leeks* and *Onions* are to be reserved and planted for Seed; the *Stalks* whereof are to be propped up with sticks, by reason of their weight: When the Seed is ripe, reserve the Heads on some Cloth, and let them be through drye're you rub them out.

There are several sorts of *Kitchen-herbs* and Plants very necessary and usefull, and also profitable to be propagated and advanced in our Country-Gardens; as *Thyme*, *Hyssop*, *Sage*, *Rosmary*, *Marjoram*, *Violets*, and several others: Their ways and manner of Planting being so Universally known, and not altogether pertinent to our discourse, I shall pass them by, and refer you to others that treat of them.

Tobacco.

I thought to have omitted this Plant, by reason the Statute-Laws are so severe against the Planters of it, but that it is a Plant so much improving Land, and employing so many hands, that in time it may gain footing in the good Opinion of the Landlord, as well as the Tenant, which may prove a means to obtain some liberty for its growth here, and not to be totally excluded out of the Husbandmans Farm. The great objection is the prejudice it will bring to Navigation, the fewer Ships being employed; and the lessening his Majesties Revenue. To which may be answered, That they are but few Ships employed to *Virginia*; and if many, yet there would be but few the less, for it's not to be imagined, that we should Plant enough to furnish our whole Nation, and maintain a Trade abroad also: And in case it should lessen the number of Ships for the present, they would soon increase again, as the Trade of *Virginia* would alter in other Commodities, as *Silk*, *Wine*, and *Oyl*, which would be a much better Trade for them and us.

And as to the lessening his Majesties Revenue, the like Imposition may be laid on the same Commodity growing at home, as if imported from abroad, or some other of like value in lieu of it.

Certain it is, that the Planting of it would imploy abundance of people in Tilling, Planting, Weeding, Drassing, and Curing of it. And the improvement of Land is very great, from ten shillings per Acre to thirty or forty pound per Acre, all Charges paid: Before the last severe Laws, many Plantations were in *Gloucestershire*, *Devonshire*, *Somersetshire*, and *Oxfordshire*, to the quantity of many hundred Acres.

Some object, that our English-Tobacco is not so good as the Forreign; but if it be as well respected by the Vulgar, let the more Curious take the other that's dearer. Although many are of Opinion that it's better than Forreign, having a more *Heartyness*, which pleaseth some; if others like it not, they may in the curing of it make it milder, and by that means alter or change it as they please. It hath been often sold in London for Spanish Tobacco.

The best way and manner of Planting and Curing it, would be easily obtained by experience: many attempting it, some would be sure to discover the right way of ordering it, and what ground it best affects.

But that which hath been observed is, That it affects a rich, deep, and warm Soil, well dressed in the Spring before Planting time: The Young Plantarised from seed in *February* or *March*, on a hot Bed, and then planted abroad in your prepared ground, from whence you may expect

pect a very good Crop, and sometimes two Crops in a year. The Leaves, when gathered, are first laid together on heaps for some time, and then hang'd up (by Threads run through them) in the shade, untill they are through dry, and then put up and kept, the longer the better. In this Experience is the best Master.

S E C T. V.

Of the manner of ordering and preparing of Gardens ground, making of Hot-Beds, and Watering of the Gardens, &c.

There are many Garden-Plats in *England*, which either for their cold situation, or the cold or unnatural temper of the soil, or such like impediments, and by reason of the ignorance of the *Gardiner*, or Owner thereof, produce little or no Fruit or Tillage answerable to the costs, trouble, or expectation of the Owners thereof: Wherefore we shall give you here the best Rules, Directions, and Instructions we either know or have read of in any of our Rustick Authors.

If the Land be of a light and warm Nature of its self whereof your Garden is made, there needs only common *Horse-dung* or *Cow-dung* to be mixed therewith in the digging or trenching, to enrich it: but if the *Ground* or *Mould* incline to a cold Clay, or stiff ground, then procure some good light and fertil Sand, or Mould of that nature, and mix with your Dung in some corner of your Ground equally together, and suffer it so to lie and rot over the Winter, which in the Spring will prove an excellent warm Manure to lay to the Roots of your Plants, or to make whole Beds thereof, by mixing it in good quantities with the natural Soil; and if you can procure it with conveniency, the more of *Pigeons-dung*, *Poultry-dung*, or *Sheeps-dung* you mix with it, the lighter and warmer it will be. Also an equal composition or mixture of Dung and Earth is necessary to be laid by, that it may be thoroughly rotten and turned to Earth by the Spring, that it may then be fit to renew the Earth about your *Hops*, *Artichokes*, and such like; and also for the Planting and Sowing therein *Coleflowers*, *Cabbages*, *Onions*, &c.

The several ways of tempering mould.

The best and surest way of sowing Seeds to have the most advantage of such Dung or Soil, and that they may come up most even, and be all buried at one certain depth, is thus: First Rake your Bed even, then throw on a part of your mixture of Earth and Dung, which also Rake very even and level, on which sow your Seeds, whether *Onions*, *Leeks*, *Lettice*, or such like; then with a wide Sieve sift on the Earth mixed with Dung, that it may cover the Seeds about a quarter of an Inch deep, or little more, and you shall not fail of a fruitfull Crop.

The best way of sowing garden-seeds.

If your Garden be obvious to the cold winds, which are very injurious to most sorts of Plants, next unto Trees, Pales, Walls, Hedges, &c. lay your ground after this following manner; that is, let it be laid up in Ridges a foot or two in height, somewhat upright on the back or North-side thereof, and more shelving or sloping to the Southward, for about three or four foot broad, on which side you may sow any of your Garden-Tillage; and these Banks lying one behind the other, will much break

To lay ground warm & dry.

break the Winds, & these shelving sides will much expedite the ripening of Pease or other Fruits, by receiving more directly the Beams of the Sun: and in case the ground be over-moist, you may Plant the higher; and if over dry, then the lower: So that it seems to remedy all extreams, except Heat, which rarely injures.

*The Making
of hot Beds.*

To make a hot Bed in *February*, or earlier, if you please, for the raising of *Melons, Cucumbers, Radishes, Coleflowers*, or any other tender Plants or Flowers, you must provide a warm place defended from all Winds, by being enclosed by a Pale or Hedge made of Reed or Straw, about six or seven foot high, of such distance or capacity your occasions require; within which you must raise a Bed of about two or three foot high, and three foot over, of new Horse-dung, of about six, eight, or ten days old, treading it very hard down on the top, being made level: and if you will, edged round with Boards; lay of fine rich Mould about three or four inches thick; and when the extream heat of the Bed is over, which you may perceive by thrusting in your finger, then Plant your Seeds as you think fit; then erect some Forks four or five inches above the Bed, to support a Frame made of Sticks, and covered with Straw, to defend the Seed and Plants from cold and wet; only you may open your Covering in a warm day for an hour before Noon; and an hour after. Remember to Earth them up as they shoot in height; when they are able to bear the cold you may transplant them.

*Of Watering
of Plants.*

Many curious and necessary Plants would suffer, were they not carefully watered at their first removal, or in extream dry Seasons; therefore this is not to be neglected. Early in the Spring, whilst the weather is cold, be cautious of watering the leaves of the young and tender Plants, only wet the Earth about it.

When your Plants or Seeds are more hardy, and the Nights yet cold, water in the Fore-noons; but when the nights are warm, or the days very hot, then the Evening is the best time.

If you draw your water out of Wells, or deep Pits, it ought to stand a day in the Sun in some Tub, or such like, for your tender Plants in the Spring.

But Pond, or River, or Rain-water needs it not, and is to be preferred before Well-water, or Spring-water.

If you infuse *Pigeons-Dung, Sheeps-Dung, Hen-Dung, Asbes, Lime*, or any Fat Soil or Matter in your Water, either in Pits, Cisterns, or other Vessels for that purpose, and therewith cautiously Water your Plants; it will much add to their Encrease and Multiplication.

For *Coleflowers, Artichokes*, and such like, let the ground sink a little round the Plant, in form of a shallow Dish, the water will the better and more evenly go to the Roots.

Water not any Plant over-much, lest the Water carry with it away the Vegetative or Fertile Salt; and so impoverish the Ground, and chill the Plant.

It is better to water a Plant seldom and thoroughly; than often and slenderly; for a shallow Watering is but a delusion to the plant, and provokes it to root shallower than otherwise it would, and so makes it more obvious to the extremity of the weather.

If

If you are willing to have the ground always moist about any Plant, place near it a Vessel of Water, putting therein a peice of Woolen Cloth or Lift, and let the one end thereof hang out of the Vessel to the ground, the other end in the Water, in manner of a *Crane*: Let the Lift or Cloth be first wet, and by this means will the water continually drop till all be dropped out of the Vessel, which may then be renewed. The end that hangs without the Vessel, must be always lower than the water within the Vessel, else it will not succeed: If it drop not fast enough, encrease your Lift or Cloth; if too fast, diminish it.

If the Weather be never so dry when you sow any sorts of Seeds, water them not till they have been in the ground several days, and the ground a little settled about them.

The several observations and directions in Planting, Sowing, Propagating, and ordering all sorts of Garden-Tillage, and tempering, and tilling the ground, and the divers Dungs, Soils, and Mixtures for that purpose are more largely and particularly Treated of in my *Systema Horticulture*, lately Printed.

C H A P.

CHAP. IX.

*Of several sorts of Beasts, Fowls, and Insects,
usually kept for the Advantage and use of the
Husbandman.*

OUR Country-Farm is of little use and benefit to us, notwithstanding all our care, pains, and cost in Fencing, Planting, or otherwise ordering the same, unless it be well stocked and provided with Beasts and other Animals; as well for labour and strength in Tilling and Manuring the ground, and facilitating other labours, and Exerciles, as for the furnishing the Market and Kitchen.

And not only for the Husbandmans own proper use, and for the Home-Market, but they are principal Instruments to maintain a Forreign Trade withal. Our Geldings are Transported for considerable returns: Our Beves yield much Butter, Cheese, Leather, Horn, Tallow, and Meat for our Forreign Trade: Our Sheep great quantities of Wool, wherewith our Cloathing is maintained, and Leather for our Glovers Trade: Our Swine excellent Bacon: Our Coneys plenty of Fur: Our Fowl store of Feathers: Our Bees Wax and Honey, &c. All conducing to support the flourishing Trade of *England*.

S E C T. I.

Of Beasts.

of Horses.

The *Horse* hath the Preheminance above all others, being the Noblest, Strongest, Swiftest, and most necessary of all the Beasts used in this Country for the *Saddle*, for the *Plough* and *Cart*, and for the *Pack*.

Where you have good store of Pasture, either in Several or in Common, or in Wood or Groves, it is no small advantage to keep a Team of *Mares* for the Breed; but where there is most of Arable, and a little of Pasture-Land, *Horses* or *Geldings* are more necessary: which difference we may observe between the great *Breeding-places* for *Horses* in the Pastures and Wood-lands, and the naked Corn-Countries; the one full of gallant lusty *Mares*, the other of *Horses* and *Geldings*.

As to the Shape and Proportion, Colours, Age, Ordering, Breeding, Feeding, and Curing the several Diseases of *Horses*, I shall here be silent, and refer you to the several *Authors* who have copiously treated of that Subject, it being too large for this place.

Only I advise you, if you keep them for Breeding, that you furnish your self with a good kind: For such did *Virgil* advise his Husbandman to obtain for his Stock, under this Character.

For

For the fair Issue of the generous Sire
Walks proudly round about the spacious Field,
Whilest his soft Thighs in supple Flexures yield,
First dares the way, and threatening Rivers take,
And o're an unknown Bride at Full-speed make;
Nor fears vain sounds: That hath a lofty Neck,
A handsome Head, short Belly, and broad Back,
Luxuriant Smelling on his valiant Breast, &c.

Those that can procure a good kind, and have the conveniences of breeding them, raise the greatest advantage that is to be made of any other Animal Whatsoever.

Asses are commonly kept, yet not to be little set by, because of their sundry Commodities, and the hardness of their Feeding; For this poor Beasts contents himself with whatsoever you give him; Thistles, Bryars, Stalks, Chaff, (whereof every Country hath store) are good meat with him: Besides, he may best abide the ill looking to, of a negligent Keeper, and be able to sustain blows, labour, hunger and thirst, being seldom or never sick; and therefore of all other Cattle longest endureth: for being a Beast nothing chargeable, he serveth for a number of necessary uses; in carrying of Burdens he is comparable to the Horse: he draweth the Cart (so the Load be not great) for Grinding in the Mill he passeth all others. Thus far Haresbatch.

The Milk of the Ass is esteemed an excellent restorative (by most Learned Physitians) in a Consumption.

But I presume one main Impediment of their not being so frequently kept, is their destructive Nature to Trees, which they will Bark with their mouths where they can come at them: This is no ways pleasing to a good Husband.

The Mule or Moil, is bred of a Mare covered with an Ass: It's a hardy Beast, much better then an Ass, and very tractable and capable of much Service.

Cows and Oxen are worthy Beasts, and in great request with the Husbandman, the Oxe being usefull at his Cart and Plough, the Cow yielding great store of provision both for the Family and the Market.

Concerning their Form, Nature, and choice, I need say little, every Countryman almost understanding how to deal for them.

As of Horses, so of Cows, Virgil's advice is to procure the best.

Who e're breeds

Brave Horses, or for Plough strong Bullocks Feeds

To choose well-body'd Females must have care:

Of the best shape the four-lookt Fleisher care;

Her Head great, long her Neck, and to her Thigh

Down from her Chin her Dimpls dangling lye.

Long-sided, all parts large, whom great Feet bears,

And under crooked Horns her bristly Ears.

Those best I like whom spotted white adorn,

Or shew the Tuke, oft butting with the Horn;

The whole Cow fair, and Visag'd like the Male,

Sweeping the ground with her long bushy Tail.

The best sort is the large *Dutch Cow* that brings two Calves at one birth, and gives ordinarily two Gallons of Milk at one Meal.

As for their breeding, rearing, breaking, curing of their Diseases, and other ordering of them, and of *Milk, Butter, Cheese, &c.* I refer you to such Authors that do more largely handle that Subject than this place admit of.

of Sheep.

Next unto these, the *Sheep* deserves the chiefest Place, and is by some preferred before any other, for the great profit and advantage they bring to Mankind, both for Food and Apparel.

Whereof there are divers sorts, some bearing much finer Wool than others, as the *Herefordshire-Sheep* about *Leicester* bear the fairest Fleeces of any in *England*. Also they are of several kinds, as to their proportion; some are very small, others larger: But the *Dutch-Sheep* are the largest of all, being much bigger than any I have seen in *England*, and Yearly bear two or three Lambs at a time. It is also reported, that they sometimes bear Lambs twice in the Year. It may doubtless be of very good advantage to obtain of those kinds, and also of *Spanish-Sheep*, that bear such fine Fleeces.

As for their breeding, curing, and ordering, I refer you (as before) to such Authors that have largely treated of them.

of Swine.

This Beast is also of a very considerable advantage to the Husbandman, the Flesh being a principal support to his Family, yielding more dainty Dishes and variety of Meat than any other Beast whatsoever; considering them as *Pig, Pork, Bacon, Brann,* with the different sorts of *Offal* belonging to them: Also they are of the courtest feed of any Creature whatsoever; being content with any thing that's Edible, so they have their fill, for they are impatient of hunger.

It is a great neglect that they are no more bred than kept than they are, their Food being obtained at so easie a rate: Besides, the *Offal* of *Corn, Whey,* and other *Culinary* Provision, it cannot but prove a very considerable advantage to sow or Plant Land on purpose with *Coleworts, Kidney beans,* and several other gross thriving Pulses, Plants and Roots, whereby you may not only raise a considerable Stock of them, to your great gain and profit, if old *Tusser* said true:

**And yet by the year have I proved e're now,
As good to the purse is a Sow as a Cow.**

but also by their *Treading* and *Batling*, in case they be kept in a Court made several for that purpose, they will convert all such Vegetables they eat not, into excellent Soil.

If they are suffered to run abroad, they waste their Flesh much; and therefore it is esteemed the most frugal and Beneficial way to keep them always Pened into some Court, both for their Flesh and Soil.

of Goats.

These are kept in some places for advantage, being a very course feeder. The *Kids* are esteemed good meat, their Hair is of use to make Ropes, and other things: it never rots in the water. The best sort of them breed twice, in the year: they are usually kept in Stables where many Horses are, being esteem'd an Antidote to preserve them from several Epidemical Diseases.

And

*And to keep Goats take thou no smaller care,
Nor less shall be thy gain, than if they were
In rich Milesian Fleeces cloth'd,*

So *Virgil* advises; but it is for their Milk, which in that Age and Country was much set by.

The Milk of Goats is esteemed the greatest Nourisher of all liquid things whereon we feed, (except Woman's Milk) and the most comfortable to the Stomack; from whence the *Poets* feign, that their God *Jupiter* himself was nourished with Goats-milk.

They crop and are injurious to young Trees; therefore are to be kept with much caution.

Virgil observed that their bite did burn such Tillage they crop; and they were by the *Italians* esteemed very pernicious to Corn, Plants, and Fruit, wherefore in their Leases they provided that their Tenants should not keep any of these sorts of Cattle: This wrong that the Tillage suffered by their Teeth was supposed to proceed from their Constitution, as being always in a Fever; for which reason Goats were not permitted to come within the Castle of *Athens*, for fear they should crop the Olive-Tree produced there by *Minerva*. Neither is it an objection that the Trees are large and tall out of their reach, for they will climb a very tall Tree, especially the Elm. Therefore such places are fittest for them that are Rocky and full of Shrubs, Goffe, and such like, where other Cattle will not thrive, as in the most part of *Wales*, and some corners of *England*, where they turn to good advantage.

Although they are not esteemed amongst the number of profitable Cattle, yet are they very necessary servants, and the most observant and affectionate of all Beasts whatever to Mankind: Their love, even to the loss of their lives, in defence of their Master, his Cattle, Goods, &c. their officiousness in Hunting, and seeking after all sorts of Prey or Game, are so commonly known, and so frequently made use of, that it's needless to tell you so.

Only that they are of different sorts and natures; some as a Guard to defend your House and Goods, others as Shepherds, to defend your Sheep and Cattle, others as *Jacks* or Watchmen, always wakefull to rouse up the heavy Mastiffs; whereof some are for the Bear, and others for the Bull.

Some Dogs are for the Game; as for the Stag, Buck, Fox, Hare, Coney, Pollicat, Otter, Weasel, Mole, &c. Also for the Duck, Pheasant, Partridge, Quail, Moor-hens, and several others sorts of Land and Water-fowl.

Others are kept for their Beauty, Shape, and Proportion, and for their docible Nature, being apt to Dance, and perform several other Acts of Activity, &c.

Besides the wilde, which are very profitable in Warrens, tame Conies may be kept to a very great advantage, either in Hutches, or in Pits, which is much to be preferred. These Pits are sunk about six or seven foot deep, in a good light Mould; or in Chalk or Sand they delight most. These are to be made round or square, and walled with Stone or Brick, to preserve the Earth from foundring. In leaving places on the sides for the Conies to draw and make their Stops or Buries.

At the one end or side make a hollow place for the *Buck* to rest in, chaining him to a small stump, that he may have liberty to go to the Rack to feed, and to his Den to rest: On the other side or end, let the places be left for the *Does* to make their stops in.

About the middle of the Pit may you place the Rack to feed them in; the *Buck* on the one side and the *Does* on the other.

In a Pit of about ten foot square may be kept two or three *Does* (besides the *Buck*) which will bring each of them about fifty or more young ones in a Year, sometimes seventy or eighty. When they are about a Month old, you may take them out of the Pit, and either spend them, or feed them in another Pit or place made for that purpose.

Their Food is for the most part Greens growing in or about your Gardens; as Carrots and their Greens, Coleworts, Sowthistles, Mallows, Dandelion, Saxifrage, Parsley, Grass, and many other. Also Hay, Bran, Grains, Oats, &c.

They ought to be constantly fed and cleansed, and great care taken to keep them from Cats, Pollcats, &c.

If you have much Garden-ground, and a good Soil free from Water, Clay, or Stone, for them to breed in, they will thrive exceedingly, and doubly repay your care and trouble.

By feeding them with dry Meat between whiles, in the Winter-season, it preserves them from the Rot, which in moist weather they are subject unto; but if you feed them much with dry Meat, you must set them water, otherwise not.

Their kinds.

The black or silver-haired are most usually kept tame, their skins being of great value.

The great *Dutch Rabbit* is the best for their food, being much larger than the other.

But the white *Shock-Rabbit* of *Turkey* is the most pleasant, having long and fine hair, and is now become the most in Mode.

SECT. II.

Of Fowl.

Of Poultry.

The *Countrymans* Farm or Habitation cannot be said to be compleatly stored or stocked without *Fowl* as well as *Beasts*, yielding a considerable advantage by their Eggs, Brood, Bodies, and Feathers, amongst which the *Poultry* seems to have the Preheminence, being more universally kept than any other sort whatsoever; insomuch that any poor Cottager that lives by the High-way-side may keep of them, being able to shift for themselves the most part of the year, feeding on *Insects*, and on any thing almost that's Edible by any other sort of Animal.

Profit of Poultry.

They are kept to a very great advantage in the Backsides, and at the Barn-doors of great Farms; and as I have been certainly informed, a good Farm hath been wholly stocked with *Poultry*, spending the whole Crop upon them, and keeping several to attend them; and that it hath redounded to a very considerable improvement. It seems also consonant to reason, especially if within a days Journey of *London*, that they might

have

have a quick return and a good Market, being in a capacity to furnish the Market throughout the Year, either with *Eggs, Chickens, Pullers, Capons, or Cocks and Hens*. And the Feathers must needs yield a considerable advantage; and the Dung of *Poultry* being of great use in the Land, much exceeding the Dung of any Cattle whatsoever.

Therefore if convenient places or houses were made for them, as dark as may be, which doth much expedite their fatning; & the *Poultry* there fed, and their Dung reserved, and before it hath taken wet let it be mixed with Earth, it will undoubtedly answer the Expence of a great part of the Corn you feed them withall.

*Feeding and
Fasting of
Poultry.*

If they are fed with *Buck*, or *French-wheat*, or with *Hemp-seed*, they will lay more Eggs than with any other sort of Grain.

*Increasing
of Eggs.*

Buck-wheat either ground and made in Paste, or whole (the former way is the better) is the best single fatner of Fowl; *Hemp-seed*, as they say, giving an ill favour to the flesh of the Bird that feeds on it: but this only upon report; if it prove otherwise, it would be one great encouragement to the Planting or Sowing of *Hemp* that the Seed should be of so great use.

In *Egypt* they hatch their Eggs in great quantities, in *Ovens* made for that purpose. In several places in this country also one Hen will lead the Brood of two or three Hens, so that they be hatched near about a time: therefore may you with much facility hatch three or four dozen of Eggs in a *Lamp-furnace* made of a few Boards, only by the heat of a Candle or Lamp; so that you order them that they may hatch about the same time that the *Hen* hatches her Eggs that you intend shall lead them: By which means in a warm Room may one *Hen* lead many *Chickens*, and raise them up with little charge, and without the loss of time of the other Hens.

*Hatching of
Eggs Artificially.*

This way may be of singular use, where you keep *Poultry* of divers kinds, that is, of the largest kinds to lay, and a few of the lesser to sit and Nurse up the *Chickens*.

Geese are a Fowl very profitable in many places where there are *Com. of Geese*, *mons* to feed them on, being a Creature that requires little care and attendance, and little charge in feeding them.

They multiply extraordinary in some places, breeding twice a year; & in all places yielding a considerable price.

Also their Feathers are no small advantage, especially if you share them as they do Sheep, as in some places is usual.

You may set them on any number of Eggs under fifteen, and above seven, giving to each *Goose* her own eggs; for it is said they will not hatch a Strangers.

It is observed of *Geese*, That in case the Waters are frozen up, (as in some hard Winters they are) about their Treading time, that then the most part of their Eggs will prove Addle. The reason is said to be because the *Goose* proves more fruitfull when she is trod by the Gander in the Water, than if upon the Land.

The Young or *Green-Geese* are best fatted if kept dark, and fed with Ground-Mault and Milk mixed together.

*Of fattening of
Geese.*

The old and *Stubble-Geese* will be fat the same way, or fed with new Malt.

But

A principal
Observation
in fattening of
Geese.

But in fattening of *Geese* you may observe, that they usually sit, especially in the night-time, with their *Beaks* or *Bills* on their *Rumps*, where they suck out most of their Moisture and Fatness at a small Bunch of Feathers, which you shall find standing upright on their Rumps, always moist; which if cut away close before you put them up to fattening, they will be fat in much less time, and with much less Meat than otherwise.

For all Water-fowl suck their Oyl or Grease at that place, wherewith they prune their Feathers, which they usually do whilst they sit still. By means wherof they are rarely wet with Rain, or by Diving, as other Fowl are.

They will feed on, and fatten likewise with Carrots cut small, and given them.

The Jews
manner of
fattening Geese.

The *Jews*, who are esteem'd the skilfullest Feeders that be, do wrap the *Goose* in a Linnen Apron: They hang her up in a dark place, stopping her Ears with Pease, or some other thing, that by neither hearing nor seeing of any thing, she be not forced to struggle nor cry. After they give her Pellets of *Ground-malt* or *Barley*, steeped in Water thrice a day, setting by them Water and Gravel; by which manner of feeding they make them so-fat, that it is almost incredible.

I have heard it confidently affirmed and related by one, That in *France* he saw *Carp*s fatted, by being bound with their Noses upright, and daily fed with white-bread and Wine: whether their Bodies were in the water or no, I remember not. This, as he affirmed, made the *Carp*s exceeding fat and pleasant.

Most certain it is, that darkness doth much conduce to the fattening of any Creature; and also rest and sleep, as appears by the *Bears* and *Foxes* in the *Northern Climates*.

Gravel not a little availeth, it being usual that when *Poultry* are penned up, and have lost their Appetite, being set where *Gravel* is, they will greedily eat it.

Of Ducks

Tame *Ducks* being much of the Nature of *Geese*, we shall say the less of them, only that they require more Water to dabble in than do the *Geese*, and that they are not so good Meat. There are some sorts of them that lay great store of Eggs, which are more to be preferred, and are distinguished from the other by the turning up of their *Bills* more than the other sorts.

Of Decoy-
Ducks.

There are a certain sort of *Ducks* kept only to draw unto them, and, as it were, Trapan whole Flocks of *Wilde-Ducks*, and bring or conduct them to the places of their retirement, which are Pools made on purpose: the manner and form wherof, and also the breeding of these sorts of *Ducks*, and the taking of the *Wilde-Fowl* they bring with them, we leave to the more skilfull in that Exercise to treat of.

Of Turkeys.

Turkeys, or *Ginney-hens*, or *Cocks*, are a melancholly Fowl, as appears by their dolefull cry, and the anger that they seem to have against red colours, being possess'd with a strong conceit that they are mocked, by reason their own Combs or Wattels are Red. They are a great Feeder, devouring more than they are worth by far, if they are fed with Corn; but if let at liberty, and have ranging room enough, they feed on Herbs, or the Seeds of Herbs, without any great charge or trouble, except in the breeding; at which time they requite carefull attendance, being an extreme chill Bird.

Some

Some having the conveniency of a Wood or Grove near their house, have let the *Hens-Turkeys* take their liberty and seek their own Nests, and take care of their Young, which they will do, concealing their Nests from the Cock, and bring up their Brood with much better success than the more tame.

They are seldom very fat till the Winter be well spent, that they forget their Lust: the cold weather gets them a stomach, & the long nights afford them much rest.

It is observed that the whitish or light-coloured Turkeys are much better meat than the blacker sort, but withall, That they are more tender in their nursing up.

Several sorts of Pigeons or Doves there are, both wilde and tame; as of Pigeons. *Wood-Pigeons*, or *Wood-Quests*, *Rock-Pigeons*, *Stock-Doves*, *Turtle-Doves*: Then there are *House-Pigeons*, such as are usually kept in *Dove-Cots*, or *Pigeon-houses*; and divers sorts of *Tame-Pigeons* fed by hand, kept for their largeness of body, for their beauty and diversity of colours, breeding almost every Month in the Year. But we shall only here treat of Pigeons kept in *Dove-houses*, that bring in unto such that are priviledged to keep them, a considerable yearly advantage, with very little cost or trouble, only feeding of them in the Snowy or Frosty weather, when nothing is to be had abroad, and about *Midsummer* before *Pease* be ripe, which time they usually call *Benting-time*, because then necessity enforeth them to feed on the *Bents*, or seed of *Bennet-grass*, no other Food being then to be had: And usually about that time have they store of Eggs and Young Ones, which will otherwise be starved unless you help them; but the Dung of their Houses will in a manner satisfy you for their Meat if carefully made use of.

There is nothing that Pigeons more affect than Salt; for they will pick To encrease the Mortar out of the Joynts of Stone or Brick-walls, meerly for the salt- Stock of nass thereof: therefore do they usually give them, as oft as occasion requires a Lump of Salt, which they usually call a *Salt-Cat*, made for that purpose at the *Salterns*, which makes the Pigeons much affect the place: The Salt-cat. and such that casually come there, usually remain where they find such good entertainment.

It is said, if Lime mixt with Sand and Water be laid in your Pigeon-house, or near it, that Pigeons will very much delight to be picking in it; but the Sand must be more in proportion to the Lime than it is usually in Common Mortar.

If *Assa-ferida* be boiled in water, and the holes washed therewith, their *Assa-ferida*. Feathers will bear the scent thereof about them, that whatsoever company they light into will be so well pleased therewith, that they will bear them company home, to the great encrease of your Stock.

This hath been always esteemed an excellent Drawer of Pigeons, either by washing the holes with water wherein it hath been boiled, or feeding them with Meat steeped in such Water. Cummin-seed.

But that which hath been experienced to have had the greatest power to draw these Birds from their former homes to the place you desire, is that you take a *Bitch* (in her heat of Lust, or hot, or salt, as they usually term it) and after she is flayed and howelled, take her in an Oven, (some prescribe to roast her with *Cummin-Seed* in her belly) then lay her in the Pigeon-house; and if you have but few Pigeons there, you shall soon find a wonderfull Encrease. This hath been an experienced way to Stock a decay'd House in a short time. Swans

Of Swans.

Swans are Birds kept for their Beauty and magnificent Deportment, being the Proudest, most Chaste and Jealous, and least sustainer of injuries of any other: Their flesh is not so much regarded as the flesh of other Water-fowl.

Fattening of Cignets.

Yet is the *Cignet* a Noble Dish at great Entertainments, which may be fattened and made the more acceptable, by keeping them apart in a close Pond out of which they cannot get, having only a little dry Grass plat to sit and prune themselves in. Near to the Water you shall place Tubs or shallow Vessels, with *Oats*, *Wheat*, *Barley*, dried *Mault*, or such like, some dry, and some in Water for them to feed on at pleasure; and sometimes cast them some hot sweet *Grains* on the Water: By this means, in one Month may they be fat.

Of Peacocks.

Peacocks are usually kept for their excellent Beauty and Deportment; yet they are beneficial to the places where they are kept, by cleansing them of *Snakes*, *Adders*, and such like: Their *Chickens* also are good Meat.

It is a Bird of Understanding and Glory; for being praised, he elevates and spreads his lofty Tail; and of Pride, for no sooner doth he behold his feet, nor thinking them compleat enough for so painted a *Pageant*, he lets his Tail fall out of meer conceit; which appears by his melancholly posture at the loss or shedding of his Tail, till nature hath renewed it.

Of some Pheasants, and the ordering of them,

In any place these may be kept for pleasure and variety; but in places near *London*, or some great City, for advantage.

Mr *Hartlib* hath the Relation of a Lady that kept so many near *Chelsey*, that she hatched two hundred in one Spring; whereof that though many dyed, yet by far the greater part would come to perfection: Also that there are many near *London* who keep them to make profit of them; That they are very easy to bring up, and to keep, when they are once past the first Month; for till then they must be kept only with *Ants Eggs*, and fed with nothing else, which are easily obtained. The first Month being past, they are fed with *Oats* only, requiring nothing else: But as they love to be kept in Grassie Fields, so one must change them oft to fresh grounds, because they taint the Grass. Also the courts may be inclosed with Laths; the Fence must be made high, and places of Refuge covered with Nets to keep the Hawk from them and their *Chickens*, which they more greedily desire than any other Game whatsoever.

S E C T. III.

Of Insects.

Over and above the Stock of Cattle, Fowl, &c. wherewith the Country-Farm is generally replenished, there are several sorts of *Insects*, that being judiciously and carefully managed & ordered, may bring into the Husbandmans Purse no small advantage. Amongst many of them that are usefull in several Countries, and to several ends and purposes, we have only two, which are *Bees* and *Silk-Worms*, that are familiarly known and preserved amongst us, whereof we shall Treat apart. And first of *Bees*.

Being

Being so commonly known and kept in this Kingdom, that there is scarcely a Village (excepting near great Cities and Towns where they are not kept; whereof there are many several Tracts written and published full of Rules, Precepts and Directions for the ordering, preserving, and managing these profitable Creatures, both after the old and commonly known method, and according to such new ways and Inventions that have been lately discovered and experienced, for the Improvement and advancement of the Income or Profit of this most admirable Creature: Which several ways of ordering them being so multitarious, and the several Tracts written of them so difficult to obtain, so intricate to be understood, and their Rules and Directions so different and uncertain, & subject to so many gross errors and mistakes, I hope it will be an acceptable work to the Countreyman for me, in this place, to give you the most select and approved Rules and Directions that are dispersed in such several Authors, and to discover unto you the many Fallacies and Deceits that some would lead you unto, by pretending newer and more advantageous ways of ordering them than before were known, who themselves had never made a through Experiment of what they published; ever reserving unto the Ingenious and Worthy *BUTZER*, the Praise and Respects justly due unto him, for his most Accurate and Excellent Piece on this Noble Subject; who hath as Methodically and complearly handled this Part, as ever any Author in our Language did any other belonging to the whole *Mystery of Agriculture*, or in any wise relating to it; yet are there many Rules, Precepts, and Ways of ordering these curious Creatures, not mentioned in his Book, else had it been needless here to have said any thing concerning them.

There is no Creature to be kept about our Rural Seat, that affords unto us so much variety of Pleasure as the *Bee*.

*The praise and
pleasure of
Bees.*

In tenui labor, at tenuis non gloria.

Virgil.

Although they are small, yet they are numerous; and although they are busied up and down on poor and mean things, yet the matter they collect is Rich and Noble: they never rest, nor are Idle, but in the extreamest cold and wet seasons. In the Spring the first warm Sun invites them abroad to seek after imployment, which they daily follow, till the bitter *Frosts*, cold and stiff *Winds*, and great *Rains* hinder them. They are out early in the morning; you shall hear them like Swarms humming on the Lime-trees by the Sun-rising, when they send forth the fragrant scents from their Blossoms. And in the Evening late shall you have them return from their hard, yet pleasant Labours.

*At fessa multa referunt se nocte minores,
Crura thymo plena, &c.*

Virgil.

But those that youthfull be, and in their *Prime*,
Late in the night return, laden with *Thyme*;
On every Bush and Tree about they spread,
And are with *Cassia* and rich *Saffron* fed,
Or Purple *Daffadils*, and *Lindons* tall,
All rest at once, at once they labour all.
Early they march, and stay till Ev'ning drives
Them from sweet Fields and Food to shelt'ring *Hives*.

Z

Idleness

Idleness is so detestable a Vice amongst them, that they will not admit of it, nor tolerate it in any (save their Sovereign) but every one is continually busied either abroad in collecting their Food, or at home in building Combs, feeding their Young, or some other employment.

*Venturaque hyemis memores aestate laborem
Experiantur,*

Mindful of Winter-labour in the Spring,
And to the publick Store they profit bring,
For some provide, and by a compact made,
Labour abroad; others at home are staid
To lay *Narcissus* Tears, and yielding Gum,
As the first ground-work of the Honey-Comb.

There are no Creatures persist in that *Unity* and *Amity* one towards another in the same House or Habitation, they having no single propriety in any thing they do or get; for whatever they gather, all have a part; if any be injured the other will revenge his wrongs, although to the loss of their Lives.

Their Labour is not compulsive, every one acting his part voluntarily, and seemingly contend and endeavour to outvie each other in their nimble and expeditious Voyages, where they so mightily lade themselves, that many times their decay'd wings are not able to support them home.

*Sape etiam duris errando in coribus alas
Attrivere, ultroque animam sub fasce dedere
Tantus amor florum, & generandi Gloria mellis.*

Virgil.

But oft their Wings are torn on Rocks abroad,
Freely spending their Lives beneath their Load;
In Flow'rs, and making Honey such a Pride,
They have, by which their Lives away do glide.

What living Creature can you keep about you, that can yield you more pleasure, delight and profit, than these that possess so little room as a small Partition of your Garden: that require no other Houses than what's made of Straw, unless you will afford them a better; that seek their own Food throughout the year, if judiciously ordered; that require so little trouble and attendance, as only a careful Inspection some few hours in the day into your *Apiary* in the Months of *May* and *June*, & the lending unto them your assistance sometimes in their defence against their Enemies, and to help them in their necessities, in the Winter-time and bad weather, when they cannot help themselves; and that yield so considerable a yearly reward unto you for all your care, pains and industry about them.

There can be nothing kept more advantageous than an *Apiary*, according to the stock or sum you lay out. Many a Countreyman hath raised a sufficient Livelyhood only from these laborious Creatures: We need produce no President for it; it is so usual, *Virgil* also seems to hint as much, where he saith,

But

*I saw an old Corycian, who enjoy'd
 Few Acres, not for Pastorage employ'd;
 Nor was it fit for Corn or Vineyard found;
 Yet were his Thorns with Silver-Lillies Crown'd
 Here you could Vervain and rich Poppy find,
 That wealthiest Kings he equall'd in his mind.
 To him huge Swarms his Bees first pregnant brought,
 And full Combs with Rivers of Honey fraught.*

But many are ready to object, that they will not thrive in this or that place, or with this or that person; and that sometimes they thrive a year or two, and no more, with many other such like conceits; which if rightly considered, it is only the ignorance, slothfulness, or wilfull neglect of the Keeper or Master of them, that occasions these mishaps: And I question not, but if the due and orderly Rules hereafter mentioned be observed, but that they will equally thrive at all seasonable times, and with all persons, the places and other accidents considered.

Principio sedes Apibus, statioque petenda. Virgil.

A convenient and necessary place is to be made choice of for your *Apiary*: It is usual for those that have but few, to place them in any corner of their Garden, or in their Courts or Backsides, and some in the Closets adjoining to their Houses, others for want of convenient room without doors, have set them in the Lofts or upper Rooms of their Houses, and in all or any of these places will this laborious Creature live: but not with that content, nor to that advantage of the *Bee-Master*, as if more propitiously disposed of; for either they have not sufficient of the Sun where-in they principally delight, and which enables them for their employment, or they are too much open to the Winds, which is a great hindrance to them in their return when laden, or they are subject to Annoyances, incident to such close corners and inconvenient places; which is a principal cause of their not thriving so well as otherwise they might do, if better placed.

Therefore where it is in your Election what place to have, and intend to possess your self of a considerable stock of Bees, make a square Plat, and sever and divide it by its self, of capacity answerable to the stock you intend to raise; but rather bigger than less, and rather long (extending from East to West) than square, facing to the South; rather inclining to the West than East, because of the Bees late returning home, that they may not then want light: But some are of another opinion, that it's best to let them have the first Sun in the morning, that they may go early abroad, that being the most apt time for the gathering of Honey: Also I have known Bees thrive very well, having the first rise of the Sun at their doors; and others not to thrive, being detained some hours from it by shadowy Trees, and in another place by a Wall; but the surest way is to let them have as much of both Morning and Evening Sun, as the Places and Fences will give way to.

You may be sure that the Morning Sun makes them swarm early in the day, else they will swarm late.

Let it be securely defended from high Winds on every side, either naturally by Hills, Trees, &c. or Artificially by Houses, Barns, Walls, &c. and let the highest Fences be on the North; the other should be but low, or far distant, lest it hinder the Sun, and also their

flight: Also let there be no ill smells or savour near it, nor that Poultry frequent the place.

Let the ground of your *Apiary* be kept Mown, not digged nor pared, because it is too hot in the Summer, and too cold in the Winter.

It is also very convenient to Plant several Trees at some reasonable distance from your Bees, as *Plum-trees*, *Cherry-trees*, *Apple-trees*, *Filberts*, *Hazels*, *Thorns*, &c. that they may pitch at swarming-time near at home, and not be in danger of being lost for want of a lighting-place; for want whereof you may stick up green Boughs, and the Bees will pitch upon them.

Also let not your *Apiary* be very far from your home, that you may be often with them at Swarming-time, and on several occasions.

Of the Seats
or Stools for
Bees.

The common or usual way is either *stools* or *Benches*; *Stools* are used by most, and esteemed the better of the two, some whereof are of Wood, and some of Stone; the Wood are esteemed the better, the Stone being hot in the Summer, and cold in the Winter. These *Stools* are placed at different heights, some on the ground, others mounted aloft two foot high; but *in medio virtus*, about twelve Inches is an indifferent height, and set a little shelving, that the Rain may run off. These *Stools* ought to be two or three Inches wider than the *Hives* you place upon them, with a place before a little broader for the Bees to light on.

These *Stools* ought to stand at least five Foot the one from the other, measuring from the middle of each other *Stool*, in streight Ranks from East to West; which Ranks, if you place them one behind another, had need be six or eight Foot asunder, and the *Stools* of the one Rank placed against the open places or intervals of the other: Place them not near the Fences on neither side, nor before, for hindring their flight.

Of Benches.

Benches are used by many; some I have seen placed the one above the other, and on each a Row of Stocks of Bees; which although they may possibly thrive, yet is not in any wise convenient; for *Benches* cannot be thought necessary, unless you place the *Hives* near together, which produces many inconveniencies. Also one cannot so easily come to them, to trim, dress, or order them, where they stand so near, or on *Benches*, as where they stand singly or apart.

The best
Seats.

But if you intend to go through with the work, and make a compleat *Apiary* worthy of your care and pains, and wherein you intend to place a part of your delight, you may make for every Stock of Bees you intend to keep, a square Cot or House of about two Foot square, and two Foot and a half in height, set on four Legs about ten Inches above-ground, and five or six Inches within the ground, and covered over with Boards or Tiles to cast off the Rain, the back or North side being closed up, and the sides respecting the East and West to have doors to open and shut at pleasure, with Latches or Haspes to them, the Face or South side to have a Falling door to cover the one half thereof, which is to be elevated at pleasure, and serves in the Summer-time for a *Pent-house*, not only to keep off the beating-Rain from the *Hives*, but to defend them from the extreme heat of the Sun, which about the Mid-day is apt to melt the Honey. The other lower half should have two small doors to open to either hand, which will serve to defend the doors or the holes of the *Hives* from such injurious Winds. When the Winter approacheth, & the cold Winds are like to injure your Bees, then may you fasten all your doors; which will as well defend your Bees from extremity of cold in the Winter, as

extremity

extremity of heat in the Summer; both injurious to this Innocent & industrious Creature.

————— *Nam frigore mella*

Cogit hyems, eademque calor liquefacta remittit,

Utraque vis Apibus pariter metuenda.

Virgil.

————— For Cold congeals the Honey and the Wax,

And Heat by melting doth the same relax;

Both which extremes the Bees alike do fear:

You may remember at the bottom of your little doors, to make an open square just against the *Tee-hole*, that the Bees may have some liberty (after you have shut the doors, to fly abroad.

Here needs no Hackle to defend the *Hive* from Rain, nor is there any fear of Wet or Wind to annoy them, here may you place any sort of *Hives*, whether of Straw, Boards, Glass, or any other thing whatsoever, without any suddain decay or loss by the injuries of weather, which by placing them abroad they are subject unto: by the means of the Side-doors, especially if you make the *West-door* to open to the right hand, may you sit secure, and observe the several Workings of the Bees in your *Glass-Hives* if you are pleased to make use of them; but if not, you may at these places order, view, and observe them, better than when they stand on naked Stools, and with less offence to the Bees, and more security to your self.

In the Winter-time if your *Apiary* stand cold, and you fear the extremity of Frost may injure your Bees, you may within these doors stuff good sweet Straw about your *Hive*, to keep your Bees the warmer.

But extremity of cold injureth not the Bees so much in the Winter, as Wet, which these Cases best preserves them from; or as Light, and the warm beams of the Sun, at such time when there is no provision abroad for them, against which, this House or Cot is a most certain preservative; for when the doors are shut in such Months, you are not willing they should fly abroad, although the Sun shine, yet they are dark, and unsensible of so small a heat, the *Hive* standing six or eight inches within the doors; when after the common way of Stools or Benches, the Sun casts his Rays to their very doors; which warmth and light together excite them forth, to the expence of their Provision, and the loss of many of their Lives, as is evident by frequent experience, the mildest and clearest Winters starving and destroying the most Bees; and on the contrary; the coldest and most frozen Winters best preserves them. It is also more plainly manifest, that in the Northern Regions, as *Russia, Muscovia, &c.* Bees do much more abound in the Woods than in these parts, their Winters being so dark and so cold, which by this way may in some manner be imitated.

In the Spring-time also there are several days that are not fit for the Bees to be abroad in; at such times may you keep the doors shut, leaving only the under-passage open, where such that list may take the Air, though by far the greater part lye still unsensible that the Spring is so near. But when you see the weather is good, and that the *Willow* or *Withy* yields them employment, you may set open your under-doors, that the warmth and light of the Sun and Air may encourage them to work, otherwise

otherwise you will hinder their early breeding, & make them slothfull; for I have had the experience, that by setting an empty *Hive* before a full, expecting that by the continual passing of the Bees to and fro through that empty *Hive*, they might stock it, that so I might have had two Stocks for one without Swarming; but it framed not according to expectation, the Bees in the inner *Hive* being so far removed from the Light and Air became lazy, and did not increase nor labour so well as those that were otherwise ordered; therefore open your doors in time, but not too early, for fear of the other extream; we can give you no certain time for it, because the Springs vary sometimes two or three weeks.

Of the Hives.

Several sorts of *Hives* are used in several Countries, but here in *England* they generally make use of two sorts, either *Wicker-Hives* made with spleets of Wood, and daubed with Cow-cloam tempered for that purpose, or *Straw-Hives* made of good Wheaten-straw bound with Bramble, which are the best and most usual that are yet common.

The *Wicker-Hives* are still at fault, the Loom mouldring away upon every occasion; which is not in any wise good for the Bees, who love not to have any Vents open but their doors.

The Form and bigness of the Hives.

There is great diversity of opinion amongst Authors, concerning the bigness and form of the *Hive*; some preferring the high and narrow *Hive* of three Foot in height, and one in breadth, or of two Foot broad, and two Foot high, neither of which can be convenient: but that Form which is most round, and in quantity about half a Bushel and upwards, is most in use, and is esteemed the best way, and fittest size for your purpose: Some you may have under half a Bushel for small Swarms.

Dressing the Hives.

Before you put any Swarm into a new *Hive*, you must make the inside as smooth as may be, from the ends of Sticks and Straws, which much trouble the Bees, who spend much of their time in gnawing them off; as in the night-time you may observe in a few days after the Hiving. After that you have picked out the greatest Sticks and Straws, then rub the inside over with a Sand-stone, & then singe it with a little flame of Straw, and wipe it clean.

Of Wooden Hives.

Hives may be made of Boards, either of an eight-square form joyned together, or round with Hoops like a Milk pail, flat on the top. In these *Hives*, if they are made of Wood that hath no unsavory scent or taste, as Deal, Beech, or such like, the Bees will delight and breed as well as in either of the other, and they will last many years, and are free from the injuries of the weather, and several other casualties that are subject unto, provided they are made with dry seasoned Wood that is not apt to shrink.

Of Glasse Hives.

In these *Hives* of Wood may be made several Glasse windows, at what height or distance you please, not only for your observation of their work, which you may with much facility & delight perceive how far they proceed, and in what time, but that the Bees may have the more light; a principal help and encouragement in their Labours.

To every of these Windows of Glasse you ought to have a small and light shutter of Wood to haſpe on the out-side of the Glasse in cold weather, and at such times as the Sun shines on that part of the *Hive*, it being subject to both extreams of heat and cold; yet so as you may take them down at your pleasure for your inspection, and leave such always down during the Summer that are from the Sun-wards.

We have also an Experiment of *Glassen-Hives*, published by Mr. Hartlib in his *Common-wealth of Bees*; as invented by one Mr. William Mew, Minister at *Easlington* in *Glocestershire*, and thus written:

The Invention is a fancy that suits with the Nature of that Creature; they are much taken with their Grandeur, and double their Tasks with delight: I took (saith he) Fourteen Quarts out of one of the Transparent Hives, double their quantity of others, they quickly paid me their Charges with their Profit, and doubled it with Pleasure. And in another place thus:

They serve only to give me an account of the daily Income, and a Diary of their Negotiations; whereby if I spend (saith he) half an hour after Dinner or Supper, I know what hath been done that day; can shew my friends the Queens Cells, and sometimes her Person, with her Retinue. She afforded me fourteen Quarts, or near upon, in one year; and if the rest afford ten apiece, I think it a fair gain. There is not a Hive to be seen about my House, nor a Child stung in a year: My Apiary consists of a row of little Houses two Stories high, two foot apart, which I find as cheap at seven years end, as Straw-Hackles, and far more handsome. Thus far Mr. Mew.

We in the same Book find a description of a *Bee-hive* made of Boards of an *Octogonal* form, with a *Glass-window* on the back-side of it, for the observation of their work; the rest of the inside of the *Hive* lined with Mat made of *Rushes*: Three of these were set one on the other, with open passages between each of them, which produced these effects: viz.

In *May*, (saith the Relator) we put in two Swarms together, leaving the places to go in open only in the lowermost, but all the passage-holes open from Box to Box: In the middlemost they first began their Combs, then in the lowermost before they had filled the middlemost, and so continued till they had filled both; which before they had quite finished, they began to make two little Combs in the upper box, &c.

The Combs in the lower Stories were well replenished with Honey, and suddenly; but these little Combs in the upper, they quite desert. Thus far that Relation.

These are the several Descriptions and Forms of *Bee-Hives* we have met withall published: but it is reported, that there are several other Fashions made, and that with very good success, as well for the advantage of the *Bees*, as pleasure of the *Bee-Master*, by several worthy and ingenious persons; it would be very much for their Credit and Reputation, and exceeding satisfactory to others, if such their Inventions and Observations were made publick.

As for my own particular, I have made many & difficult Experiments and Essays towards the advancement of the profit and pleasure of this industrious Animal, and have made use of most of the former sorts of *Bee-Hives*, and framed several others, with Remedies and Provisions for such inconveniences and omissions I found in the other; and have with as much caution observed the Operations and Nature of *Bees* throughout the whole year, as my occasions would give way to, and my shallow capacity could apprehend; as you may find by the sequel of the *Tract*: Yet have I not finished to attain the right Method, or way of ordering them, as I principally aim at. The two unseasonable years for *Bees*, 1665, and 1667; and my present Removal, preventing the greatest part of my design; It also being the work of a year, or at least that part of time that comes but once a year, to make one Experiment or Observation.

servation. And the Observations already published, which ought to be a Guide, prove rather an *Ignis Fatuus*, to lead one out of the way, than an *Index* to point out the truth; as we shall hereafter in this Book make appear.

Nevertheless this Observation I have found to be true, *viz.* That *Bees* delight not in an high Habitation; the broader and flatter it is, the better they prosper; for they cannot with ease pass through the intervals of their Combs to the Summit of their *Hives*: Therefore if you mean to make a *Hive* wherein they should delight, let it not be very high, but allow it as much in breadth as you please, they will be sure to fill it.

Of Spleeting
of the Hives.

But before we have done with the *Hives*, we must not forget the *Spleeting* of them. The way they usually Spleet the ordinary Strawn & Daubed *Hives*, every *Country Coridon* understand. As for our *Wooden* or *Glass-Hives*, some prescribe that there be three down-right sticks from the top to the bottom, and about two small Hoops fastened unto them at convenient distances, which will very well serve for the fastening and supporting of the Combs, which way I have used: its best to let the perpendicular sticks extend to the bottom, for the *Bees* the better to crawl up by them to the Combs; but you may have only down-right sticks, or any other ways placed, as best agrees with the Form of your *Hive*; so that there be not too wide intervals between.

Of the
swarming of
Bees.

Having prepared such *Hives* you design to make use of, the only way to stock them, is by putting the Swarms into them; notwithstanding I have many times attempted to intice, and inforce them without Swarming (confiding too much on the Writings and Reports of other men) out of their own old Habitations, into my new *Hives*.

Several Expe-
riments to in-
crease Bees
without
swarming.

The one way I used was this; I set an empty *Hive* before a full, that the *Bees* passing from their old through the new and empty *Hive*, might chuse rather to live therein, than go forth in Swarms to seek another: but the long and darksome passage, being of Strawn-Hives, made the *Bees* lazy (as before we noted) together with the unseasonableness of that year, that the *Bees* did not breed any more than to maintain their old Stock; so that my design became fruitless.

The presuming on that Principle, that the *Bees* always, begin their work above, and so work downwards, I took an old Stall of *Bees*, and long before breeding-time inverted the same with the skirts upwards, and the tops downwards, in an hollow stool made for that purpose, and placed thereon one of my new wooden *Hives*, with Glass-windows thereto, having a bottom which covered the whole under-*Hive*, save only a wide hole in the middle, through which the whole Stock of *Bees* have their passage in my new *Hive*; and so out at the door of my new *Hive* they continually passed to and fro. In the Summer-time when the under-*Hive* was over-full, they took to the top of the new *Hive*, and built there some few Combs; which before Winter, when their number lessened, and the under-*Hive* was able to contain them all, they deserted; & did not according to my expectation, forsake their old Stock, and take altogether to the new, although the same were above them, and the old one under them: But in all probability I had had a great number of Combs, and a greater stock of *Bees*, and they also so would have continued longer; which would much have elucidated this Experiment, had it not fallen out to be in such a year that few Stocks yielded any Swarms.

Another

Another way I made use of was this: thinking the *Bees* would leave no place above them uninhabited, I cut off the top of a *Strawn-hive*, until I had made a passage through the top of the Combs, and thereon I placed one of my *Glassen-hives*, with a bottom, and a hole in the midst thereof, through which I used all the means I could to provoke the *Bees* to pass, but in no wise would they; for as soon as they were in the upper, though light by means of the Glass, yet they immediately returned.

Also I placed several Stocks in *Strawn-hives*, on *Wooden-hives* with *Glass windows*, and left convenient passage out of the one into the other, with a cover to the hole that passed between the two *Hives*, which I might move at pleasure. I stopped the doors of the *Strawn-hive*, that they had no other passage than through the *Wooden-hive* wherein at Swarming time they built many large Combs, & stored them well with *Honey* (it being a good year for breeding *Bees* wherein I made this Experiment) but when the cold weather came, & the number of *Bees* began to lessen, which they always do against the Winter, they crowded all up into the upper *Hives*, carried up or spent the *Honey* in the new Combs, and deserted them, leaving them as an empty Spectacle through the *Glass-windows*.

The one of these Stocks about Swarming-time having a good quantity of *Bees* in the under *Glass-hive*, I shut the passage between the upper and lower *Hive* with the *Shutter* made for that purpose, and took away the upper Stock, & set in another place, thinking thereby to have two Stocks for one, (the *Bees* being as equally divided as might be) yet the *Bees* in the under-hive having lost their old passage, or not having their *King* or *Queen*, or for some cause or other, did not like their habitation very well, but in two or three days were most of them gone into their old *Hive*, or lost; which compelled me (for further tryal sake) to place the one over the other, as before; then they fell again to their business: So that by any way hitherto essayed, I cannot discover how to encrease my Stocks, as to number, without giving them leave to Swarm or go forth in companies from their own homes (as it were) with their Prince or Leader, to seek a new Habitation.

But having thus far spent much time and labour to understand the Nature of these wonderful and industrious Creatures, and finding these Attempts not to answer my expectation, I was unwilling to desist; the Errors of one, usually leading to the discovery of another and better Experiment: but began a new way, and more probable than the other; which is, in every *Bee-hive* of Wood with *Glass-windows* I had a large Pipe of about two inches square in the clear, that came from the top of my *Hive* to the bottom, open at both ends: at the bottom it was cut on the four sides Arch-wise, that the *Bees* might on every side ascend freely up the Pipe. I fitted a piece of Wood into this Pipe, to prevent the *Bees* from making any Combs therein, until such time as the Swarm put in it should fill the *Hive*: then would I place another of the same sort and fashioned *Hives* on the top thereof, with his door open also, (having first taken out the stopple fitted to the Pipe) that the *Bees* from the bottom of their own work might ascend through that Pipe into the newly placed *Hive*; which way when they had once discovered, doubtless they would rather take to than swarm: by which means it is most probable you may multiply your Stocks, by placing *Hive* upon *Hive ad infinitum*, and drive your *Bees*, &c. which I had thoroughly proved, had not my removal prevented me; that I can promise you no assurance of the effect, but hope to give a better ac-

count thereof in a few years; discovering thus far of what I have seen and made experience of, that you might avoid those difficulties and errors I met withall, and proceed on such ways that succeeded well, and are in probability to answer what your desire is.

The bigness
of Swarms or
Stocks of
Bees.

Where your design is for Multiplication of your Stocks, there it's best to make your Hives the smaller; and where you aim at great quantities of Honey, there make them the greater: So that in case you cannot prevail in the one, it may nevertheless be a considerable and sure advantage in the other; as is evident in Mr. *Mew's* Experiment of his *Transparent Hive*, out of one of which he took fourteen quarts of Honey; then it is very probable the Hive held twice as much, for the Wax, Bees, and vacant places: so that his Hive was of an extraordinary bigness, and yielded an extraordinary advantage.

Also in the other before-mentioned Experiment, the *Octagonal Boxes* or Hives are of a very great bigness, at least two foot wide, and of about fifteen inches deep, into which they put two Swarms together, which filled two of them in the first Summer.

Also in the History (*Bulwer* mentions in his *Feminine Monarchy*) of the *Bees* that settled over *Kiva's* his Study, having so much room, what an incredible Mass of Honey was there produced.

Therefore we cannot but urge this as a part of good Husbandry, to have a set of well-made Hives transparent, or with lights of a good capacity, or to be added the one above the other, as we said before; although it be only for the encrease of Honey, and another set of smaller Hives only for the encrease of Swarms; for a few Hives in a thriving condition, and well ordered, will yield you Bees enough to Stock many of your larger Hives.

Signs of
Swarming.

If the Spring be milde, calm, and showring, then it is good for Swarms, and they will be the earlier; but if it prove a cold, dry, & windy Spring, such as were 1665 and 1667, then will there be but few Swarms that year, and those also very backward.

About the middle of *May*, in an early Spring, you must begin to look after them, & observe what you can of the usual signs that precede their swarming, that you may be the more watchfull over those that require it when the Hives are full (before which they will never Swarm) they will cast out their Drones, yea although they be not quite grown. Secondly, the Bees will hover about the doors in cold Evenings and Mornings. Thirdly there will be moistness and sweating upon the Stool. Fourthly, they run hastily up and down. Fifthly, they lie out in Sultry Evenings & Mornings, and go in again when the Air is clear.

Signs of pre-
sent Swarm-
ing.

If the weather be warm and calm, the Bees delight to rise, but especially in a hot Gleam, after a Showre or Gloomy Cloud hath sent them home together; then sometimes they gather together without at the door, not only upon the Hive but upon the Stool also; where when you see them begin to hang in Swarming-time, and not before, then be sure they will presently rise if the Weather hold.

Signs and
causes of not
Swarming.

To lie forth continually under the Stool, or behind the Hive, &c. especially towards the middle of *June*, is a sign or cause of not Swarming: for when they have once taken to lyeforth, the Hive will always seem empty, as though they wanted company; then will they have no mind to Swarm.

Also

Also much stormy and windy Weather will not suffer them to Swarm when they are ready, and that makes them lye out; and the longer they lye out, the more unwilling they are to Swarm.

Another cause of their lying forth, is continual hot and dry Weather, especially after the *Solstice*; which causing plenty of Honey both in Plants & Dews, their minds are so set upon that their chief delight, that they have no leisure to swarm, although they might most safely come abroad in such Weather.

First keep the *Hive* as cool as may be, by watering and shadowing both it and the place where it standeth; and then enlarging the door to give them Air, move the Cluster gently with your Brush and drive them in. To make them Swarm.

If yet they lye forth, and swarm not, then the next calm and warm day about noon, whilst the Sun shineth, put in the better part with your Brush, and the rest gently sweep away from the stool, not suffering them to Cluster again: These rising in the calm heat of the Sun, by their noise as though they were Swarming, will make the other to come forth perhaps unto them, and so they may Swarm.

Divers other ways have been attempted to cause Bees to Swarm, as by placing a large Pewter-Charger or Platter under the Cluster of Bees, as they hang out in the heat of the Sun; so that it may strongly reflect the heat of the Sun against the Bees, which will provoke them: or else the smooth paring of the Ground under the Bees, and covering it with Sand, may probably make them Swarm.

Some say that in case the Combs are built so that they range from the back of the Hives to the Tee-hole, and not from one side towards the other, but so that the Bees may go directly against the edge of the Combs, that they will be more apt to Swarm than if they went against the Flat of the Combs.

The error of the Bees, in ranging their Combs, may be rectified by new cutting the Tee-hole in the winter.

Others have said that in case the Hives be made narrower at the bottom than upwards, the Bees will be more apt to Swarm than if the bottom be broad.

If none of these serve to provoke them to Swarm, but that they lye forth still, then rear the Hive enough to let them in, and cloom up the skirts all but the door: If this succeed not, there is no remedy.

The signs of *After-swarms* are more certain: when the Prime-swarm is gone, about the eighth or tenth Evening after, when another Brood is ready, and again hath over-filled the Hive, the next Prince beginneth to Tune in her Treble Voice, a mournfull and begging note; then in a day or two shall you hear the old *Queen* in her *Base Note* reply, and as it were consent. In the Morning before they swarm, they come down near the Stool, and there they call somewhat longer. At the very time of *Swarming* they descend to the Stool, where answering one another in more earnest manner, with thicker and shriller Notes, the multitude come forth in great haste, &c. Signs of After-Swarms.

If the Prime Swarm be broken, the second will both call and Swarm the sooner, it may be the next day, and after that a third, and sometimes a fourth; but all usually within a Fortnight: Sometimes also a Swarm will cast another that Year.

Ringing of
Bees.

When the Swarm is risen, it is the usual custom to play them a fit of Mirth upon a Pan, Kettle, Bason, or some such like Instrument, upon pretence to gather them together, and make them settle; which Custom seems to be very Ancient, as *Virgil* witnesseth.

Finitusq; sit, & matris quate Cymbala circum; &c.

Make a shrill sound,
And beat the Cymbals of the Goddess round.

Some think that it begets a fear in them, which makes them light on the next place: Others think that it is because they delight in the noise, but this by experience is found to be needless, and by *Lever* in his Treatise of Bees it is esteemed as a ridiculous Toy, and most absurd Invention, and rather hurtfull than profitable, because all great noise doth disquiet and hurt them; he saith he had above forty Swarms in a Year, without the loss of one; when his Neighbours having a far less number, and using this kind of Jingling, lost divers. Also *Butler* makes no other use of it than where there many *Apiaries* near, publickly to notify the time and place of their rising, that to a just and open Claim may be laid unto the Swarm; esteeming the pretended reason of staying the Swarm to be a meer fancy.

But if they fly aloft, or are like to be gone, cast Dust amongst them to make them come down.

Hiving of
Bees.

When your Swarm hath made choice of a lighting place, you shall quickly see them knit together, in form of a Cone, Pine-Apple, or Cluster of Grapes; when they are fully settled, and the Cone hath been a while at the biggest, then Hive them.

First (having in store several Hives of several bignesses) make choice of a Hive proportionable in bigness to your Swarm, that the Bees may go near to fill it that year; but rather under-hive a Swarm than over-Hive them.

Then rub the Hive with sweet Herbs, as *Thyme*, *Savory*, *Marjoram*, *Baile*, *Fennel*, *Hysop*, *Mallows*, or *Bean tops*, &c. and with a Branch of *Hazel*, *Oak*, *Willow*, or any other of the aforesaid Herbs, but rather of the same Tree whereon the Swarm lighted, wipe the Hive clean, and dip such Sprig or Branch into Mead, or fair water mixed with a little Honey, or with Milk and Salt, or Salt only, and therewith besprinkle the Hive. Then having first drank a Cup of good Beer and washed your hands and face therewith, or being otherwise defended, if the Beer hang upon a bough, shake them into the Hive, & set the same upon a Mantle or Cloth, on the ground, as is usual; or you may cut off the bough if it be small, and lay it on the Mantle or cloth, and set the Hive over it, which is the better way.

If they light near the ground, lay your Cloth under them, and shake them down, and place the Hive over them; and such Bees that gather together without the Hive, wipe them gently with your Brush towards the Hive; and if they take to any other place than the Hive, wipe them off gently with your Brush, and rub the place with *Mugwort*, *Morgan*, *Wormwood*, *Archangel*, or other bitter or noisome Weeds or Herbs.

Then set the Swarm, as near as you can, to the lighting-place till all be quiet, and every one knows his own home.

If

If the Swarm part and fight in fight one of another, let alone the greater, and disturb the lesser part, and they will fly to their Fellows; but if not in fight, then *Hive* them both in two several *Hives*, and bring them together, and shake the *Bees* out of the one *Hive*, on the *Mantle* where on the other *Hive* stands, and place the other full *Hive* on them, and they will all take to it.

If it happen that your Swarms come late, after the middle of *June*, and that they are small, under the quantity of a Peck, then put two or three of them together, whether they rise the same day, or in divers: for by this uniting, they will labour carefully, gather store of wealth, and stoutly defend themselves against all Enemies. The manner of uniting is thus.

Uniting
Swarms.

In the Evening when it waxeth dark, having spread a *Mantle* on the ground, near unto the Stool where this united Swarm shall stand, and set a pair of *Rests*, or two Supporters for the *Hives*: knock down the *Hive* out of which you intend to remove your *Bees* upon the *Rests*; then lifting up the *Hive* a little, and clapping it between your hands to get out the *Bees* that stick in it, lay it down side-ways by the *Bees*, and let the Stock or Swarm to which you would add them upon the *Rests* or Supporters over them, and they will forthwith ascend into the *Hive*; those that remain in the empty *Hive*, by clapping it, will hasten after their company: then when you have gotten them all in, either that night, or early in the next morning, place the *Hive* on the Stool, &c.

Place the *Hive* wherein you have newly put your Swarm you intend to drive into another, in a place that the skirts may be uppermost, and set the other upon them, binding them about the skirts with a long Towel; and so let them stand till the Morning, and the *Bees* will all ascend, that you may the next Morning set the Receiver on a Stool: and thus may you put three or four Swarms together; but observe to unite them the same Evening, or the next a farthest, that the Swarm; lest having made Combs, they are the more unwilling to part from them.

A better way.

In these several ways of dealing with *Bees*, it is good to defend ones self as well as may be against their stinging, which to some persons proves very troublesome, especially if they are uncleanly, or have any ill scent about them; therefore with caution must they be tampered withal. Some only drink a Cup of good Beer, and find that sufficient; others wash their hands and face therewith, which proves a good defence; I have gone amongst them in their greatest Anger and madness, only with a handfull of sweet herbs in my hand, fanning about my face, as it were, to obscure and defend it. Also if a Bee do by accident buzz about you, being unprovided, thrust your face amongst a parcel of Boughs or Herbs, and he will desert you. But the most secure way of all, and beyond the complearest *Harnes* yet published, is to have a Net knit with so small Meshes, that a Bee cannot pass through, and of fine Thred or Silk, large enough to come over your Hat, and to lie down to the Collar of your Doublet, through which you may perfectly see what you do without any danger, having also on a good pair of Gloves, whereof Woolles are the best.

Defence a-
gainst Bees.

But if the Bee happen to catch you unawares, pull out the Sting as soon as you can. Some prescribe to wash the same with your Spittle, and say that that will prevent swellings: Others commend the rubbing thereon the Leaves of *Merigolds*, *Honseleek*, *Rue*, *Mallows*, *Poy*, *Hollyhock* and *Vinegar*, *Salt* and *Vinegar*, and divers other things: But the most sure and Natural Remedy, is to heat a piece of Iron in the fire, or for want

To cure the
Sting of a Bee.

of

of that to take a live Coal, and hold it as near and as long to the place as you can possibly endure it, which will Sympathetically attract the fiery venom that by the sting was left in the wound, or force it out of the place affected, and give you an immediate ease and cure. The same it will affect on the bitings or stings of Snakes, or other venomous Creatures; and it's probable, on the bitings of mad Dogs: but of this in another place.

Of the Bees
Work.

As soon as a swarm hath entred its *Hive*, they immediately (if the Weather permit) gather Wax and build *Combs*, that in a few days time there will be several large and compleat *Combs*; they lie so thick about them, that it's impossible one quarter of them can be employed at once, until the *Combs* are brought to a considerable length: and then a great part of them may be employed in filling them, the rest in finishing their *Cells* or *Combs*.

It's a difficult matter in our *transparent Hives*, to discern how these admirable Creatures frame their curious Workmanship, by reason they are so numerous that they generally cover their whole work, that unless the *Bees* also were transparent (as *Busler* terms it) it cannot be discerned: But through the *Glass* you may observe how they carry up their far-fetcht goods, and what a mighty stir they make, and how perpetually busie they are, and in a clear day when most are abroad, especially towards the end of the Summer: Also when their Young *Bees* are fit for service, and are abroad, which are those chiefly that hide so much of the *Combs*; then may you plainly discern their *Combs* and *Cells* filled with bright and clear Honey.

The numbers
of Bees.

Their numbers, towards the end of Summer, begin to lessen, which gives you a great advantage of beholding them and their work: For in their prosperity at Swarming-time, and shortly after, they are far more in number than in the *Autumn* or *Winter*; as you may easily discern between the quantity and number of a *Swarm* and those you kill when you take them; for the *Bees* of the last years breed do now by degrees waste & perish; by their extraordinary labour, their *Wings* decay and fail them: so that a Year, with some advantage, is the usual age of a Bee, and the young only of the last Spring survive and preserve the kind till the next.

Of the Bees
Enemies.

There are several things that are injurious to *Bees*, and much hinder their prosperity, if not prevented.

1. *Noise*; which may in part be remedied by the scituation of the *Apiary*, free from the *Noise* of Carts and Coaches, the sound of *Bells*, from *Ecchoes*, &c.

2. *Smoak*; I have known that when *Land* hath been burn-beaten, near unto an *Apiary*, and the *Wind* brought the *Smoak* towards it, that a great part of the *Bees* intercepted by the *Smoak* in their flight, have been destroyed; which is a principal cause that *Bees* thrive not in or near a great Town.

3. *Ill Smells* are very offensive to them, as before we noted.

4. *Ill Weather*, as *Winds*, *Rain*, *Cold*, *Heat*, &c. prevented by the situation and fencing the *Apiary*, and ordering the *Stocks* as before.

5. The *Mouse*, *Birds*, and other devouring Creatures, which are to be destroyed, as hereafter we shall shew you.

6. Noisome Creatures; as *Toads*, *Frogs*, *Snails*, *Spiders*, *Moths*, &c. which you must endeavour to keep out of your *Apiary*; and also cleanse your *Hives* ever and anon from these *Vermine*.

7. *Hor*:

7. *Hornets and Wasps*, in such years wherein they abound, prove great Enemies to the Bees, by robbing them of their Wealth, which are destroyed by placing near the door of the Hive a Glass Vial half full of *Cider, Verjuice*, sowre Drink, or such like, wherein they go, and never return.

8. Bees themselves prove the greatest Enemies, both by fighting and robbing. Several occasions provoke the Bees to fight; which if the Battle be but newly begun, may be hindred by stopping up the Hive close where they begin to fight; or if it be so far gone that most of the Bees are out, and that the conflict is very great, the casting up of Dust amongst them was the ancient way to pacify them, as *Virgil* witnesseth.

*Hi motus animorum, atq; hac certamina tanta
Pulveris, exigui jactu compressa quiescent.*

*These huge Commotions, and so mighty War,
Quickly with thrown-up Dust appeased are.*

But *Butler* condemns this custom; and also of casting Drink amongst them.

To keep and preserve your Bees from Robbers, which are very usual both in the Spring and Autumn, you must be sure to close up the Hives very close, leaving the doors very small; and, according to the season of the year, to widen and streighten them, as you may observe in the *Kalendar* towards the end of this Book inserted.

The best time to remove an old Stock, is a little before, or a little after *Michaelmas*; or if you have over-slept that time, then about the end of *February*, or beginning of *March*, before they go much abroad, lest it prevent their Swarming: or you may remove any time of the Winter, though not so well as in the aforesaid seasons.

For the removing of a Swarm, it is best to do it in the Evening next after the Hiving.

Let the Weather be fair, as near as you can, when you remove; and let it be done in the Evening, when all the Bees are quiet.

The best way is thus: Take a board about the breadth of the bottom of the Hive you intend to remove, and in the Evening, on two or three Evenings before you remove your Stock, lift it up, and brush the Bees that are on the Stool forwards; or let the Board be a little supported by two ledges, to prevent the Death of the Bees on the Stool, and this Board set your Stock, and so let them stand till you remove them: when you come to remove them, stop up the door of the Hive, and set the board whereon the Hive standeth on a *Hand-barrow*, and carry them to the place you intend, and there place them: by which means they are not all disturbed, nor a Bee injured, nor the Hive nor Combs crushed by the squeezing of the Cloth, nor yet a Cloth used about them.

This of all other things belonging to an *Aptary* is of least use: First, because Bees that have not a probable Stock of Honey to serve them over the Winter, are not fit to be kept: And then because they that are Bee-Masters, and have not care enough of them to keep them from spending that Stock they have in the Winter-time, must not expect to reap any considerable advantage by this profitable Creature, nor I presume will ever take so much pains and care as is required in feeding them.

Yet

Yet are there some Stocks of Bees in the Spring-time, that may seem worthy but care to preserve them, viz. such that having but a thin stock of Honey, and a good quantity of Bees, by means of a cold dry and unseasonable Spring, cannot make such timely provision, as in other Years they might have done; yet in all probability may prove an excellent stock. It would prove a piece of gross neglect of our own Advantage, and a piece of Cruelty to these distressed Animals, if we should not lend our Assistance.

Manner of Feeding.

Which may be several ways applied, but best by small Canes or Troughs conveyed into their Hives, into which you may put your Food you give them; which must be daily continued till the Spring season affords them easy & sufficient provision abroad, because at that time their Combs are full of young Bees.

Food for Bees.

Of all Food, Honey is the best and most natural; which will go the farther if it be mixed well with a moderate proportion of good sweet Wort. Some prescribe Toasts of Bread topped in Strong ale, and put into the Bee-hive, whereof they will not leave one Crumb remaining. Some also advise to put into the Hive dry Meal or Flour of Beans: others Bay-salt, roasted Apples, &c. which are all very good.

An experiment for improving of Bees.

Take a handfull of Baum, one dram of Camphire, half a dram of Musk dissolved in Rose-water, as much yellow Bees-wax as is sufficient, Oyl of Rose as much, stamp the Baum and Camphire very well, and put them into the Wax melted with the Oyl of Rose, and so make it up into a Mass: let it cool before you put in the Musk, for otherwise the heat will fume away most of the scent of it.

Take of this Mass as much as an Hazel-nut, and leave it within the Bee-hive; it will much encrease the number of your Bees. You shall also find both in Honey & Wax three times more profit than otherwise you should have had. Vide Commonwealth of Bees.

A singular observation concerning the food of Bees.

In Kempen-land in Germany (saith mine Author) I have seen about forty great Bee-Hives; which contain when they are full, about seventy pound weight in Honey, placed near a great Field sown with Buck-wheat. And it was related to me of a truth by the Inhabitants, that the Bees did suck such plenty of Honey out of it, that in a fortnights time the said Hives were all filled therewith.

This we find confirmed by every years experience, that the Bees feed much on Buck-wheat; for when that is in Blossom, it is sufficiently stored with Bees daily humming through the Field; and the Bees by their pale-coloured Shanks at their return home, shew whence they have their Store.

Also Anniseed sown near the Apiary is esteemed an extraordinary delightful food for Bees.

Of the fruit and profit of Bees.

The principal aim of most Bee-Masters is advantage; and it hath been the general design of Experimenters to discover which way this most industrious and profitable Creature may be multiplied and maintained with the least expence, care, and trouble, and also to the greatest advantage; for they require no more than a house of straw, unless you can afford them a better; their food they seek where it will never advantage you, nor any body else, if they have it not. Your circumspection and care only is required to order and preserve them; which also is but little, if you understand their natures and temper, and will seem much less, if you make it one of your exercises of delight and pleasure.

Yet

Yet do they return you an extraordinary recompence and reward for whatever you bestow on them, as before we have observed.

But that which hath been principally designed, is to find out some ways or means how, or after what manner the fruit and profit of *Bees* may be taken without the loss of their Lives; it being a seeming act of cruelty to destroy the Lives of these most industrious Creatures, to rob them of their goods.

The one way that hath been used to this purpose, is the driving of *Bees* after this manner: In *September*, or any time after they have done breeding, (else will the Honey be corrupted by the *Skaddons* in the Combs) place the *Hive* you intend to take with the bottom upwards, between three or four stakes, and set the *Hive* you intend to drive the *Bees* into over the same, as before we directed in the uniting of Swarms; then often clap the under-*Hive* between your hands in the Evening, and so let them stand till the morning, and then clap it again; and set the full *Hive* on the Stool, a little bolstered up, that the *Bees* may have free Egress and Ingress: then clap the empty *Hive* again, and get as many *Bees* out as you can, which will repair to the other *Hive*. This way is something troublesome to the unexperienced, yet beneficial in such cases where you have a great stock of Honey, and few *Bees* in one *Hive*; and a small stock of Honey in another; by which means you save the lives of most of your *Bees*, which will gladly exchange their hungry Habitation for a more plentiful.

Driving of
Bees.

Exsection is a way hath been practised by the Ancients, and hath been much endeavoured after to be revived again, though not with any good success; for if you take away any part of their Combs in the Spring, they are then full of *Skaddons*, which spoil the Honey, and also destroy the breed of your *Bees*: If you take away the Combs in the Autumn, then will they want them in the Spring following to lay their Young in, which they usually do before any new matter is to be found to build withall.

Exsection of
gelding of
Combs.

So that the new inventions of making *Bee-Hives* to open with doors to take out Combs at pleasure, are fruitless and ridiculous Toys, published by such that know not the nature of *Bees*, nor their work; who fix their Combs on every side, that you cannot easily open your door; and if you could, the *Bees* would prove too busie for you to meddle with their Combs; whom if you should overcome, yet the former inconveniencies would follow.

Others have advised to make *Bee-Hives* to place the one over the other, and some to be placed the one at the end of the other successively; that when the *Bees* have filled the one, another being added they would fall to work, and fill the next, and leave the former, and so fill several one after another; and that you may take the *Hive* that was first filled away for your use: and have also described unto us the particular ways of ordering these new-invented *Hives*, and how every particular thing is to be done, as though the Authors thereof had had long experience in it; which hath encouraged many to the prosecution of the design.

Which I find to deceive us in several particulars: for the *Bees* build Combs only at the former part of the Summer; and after they have prepared sufficient Receptacles wherein to dispose their Honey, and answerable to their number, their matter also being much wasted, which they gather abroad for the making of their Combs, they then

fall to work for the storing of their *Cells* with food for the approaching Winter: so that whatever room you give them more, seems superfluous, and rather proves a burthen than an advantage unto them. The next year it's in vain to give them more room, unless it be to a young Stock that could not, or had not time enough to build sufficient the precedent year, or to an old Stock that was freightned in room before, as usually our Swarming Stocks are.

Also when you expect to take the top or fullest Combs, you will find the *Bees* most there: for they will not (as some fondly imagine) desert the more remote, and lye in the nearer Combs; but on the contrary, as I have often found.

But that which seems to me the more probable way (for I have not yet fully experienced it) is to make your *Hives* very small, either the one over the other, or the one behind the other; and if you find they have a sufficient stock of *Honey* to preserve them in the remainder, you may take the most remote *Box* or *Hive*, and place it the nethermost, and so drive the *Bees* into the other: but this also must be submitted to farther Tryals.

To conclude from what we have before Treated, I judge it the most prudential way to have in your *Apiary* a sufficient stock of *Bees* kept for Breeding and Swarming, and another Stock kept in large *Glass hives*, whereof we have before discoursed, for the raising of great quantities of *Honey*, which they will much better in those *Hives*; and I see no reason why we should judge it a greater piece of cruelty or inhumanity, to take away the lives of these Creatures (who have so short and insensible a life and die so easily) for their *Honey*, then to take away the lives of any other Animals to feed on their Carcasses; which is daily done, and that with very high degrees of torture: Neither can it be any loss to the *Bee-master*, who may have an Annual supply by his Swarming-stocks kept for that purpose, as the great Flocks of *Weathers* are yearly supplied from the Flocks of *Ewes*, and the large and vast fatning Ponds of *Carps* from the lesser breeding Ponds.

Virgil.

*Sed si jam proles subito defecerit omnis,
Nec gens unde nova stirpis revocetur, habebit:*

But should the whole stock fail, not one remain,
From whom they would desire their House again:

Which rarely happens to a carefull *Bee-master*, but if it should,

Idem.

*Tempus & Arc adimemoranda iuvanta Mugistri,
Pondere.*

The *Arcadians* rare invention we must here
Remember, who with Blood of a slain Steer
Oft *Bees* restored.

Generation
of Bees.

Which invention of the *Athenian Bee-Master* is at large described
in *Virgil*, & with which, in Effect agrees the Experiment of our Modern
and

and great Husbandman, old Mr. *Carew* of *Cornwal*, which is thus: Take a *Calf* or *Steer* of a year old, about the latter end of *April*; bury it eight or ten days, till it begin to putrifie and corrupt; then take it forth of the Earth, and opening it, lay it under some Hedge or Wall, where it may be most subject to the Sun, by the heat whereof, it will a great part of it turn into Maggots, which without any other care, will live upon the remainder of the corruption: After a while, when they begin to have wings, the whole putrified Carcass would be carried to a place prepared where the Hives stand ready; to which, being perfumed with Honey and sweet Herbs, the Maggots after they have received their wings will resort.

Another Author hath it thus, Build a House ten Cubits high, and ten broad, every side equal to the other; let there be one door, four windows, on each side one; bring an Ox into it 30 Months old, Flethy and Fat; set young fellows to kill him with Clubs, and break the Bones in pieces, but let them be sure they make him not bleed; nor strike too hard at first; Let his Eyes, Ears, Nostrils, Mouth, and other passages for evacuation be presently stopp'd with clean fine Linnen dipp'd in Pitch; lay him on his back over a great quantity of Thyme, and let the Doors and Windows be stopp'd with Clay, that the House be not perspirable with Wind or Air. Three weeks after open the Windows on every side, but that whereon the Wind blows; when it is sufficiently Air'd, close it up as before. Eleven days after when you open it, you shall find it full of Bees in clusters, and nothing left of the Ox but Horns, Bones and Hair: The Kings (they say) are bred of the Brains, the others of the Flesh.

Geopanic.

If these Experiments should succeed, we may well sing with *Virgil*.

*Quis Deus hanc, Musa, quis nobis excudit. Artem?
Unde nova ingressus hominum experientia capit?*

What God, Oh Muse, this strange Art did invent!
From whence had Man this new Experiment?

Or if you are unwilling either to credit or make trial of this Experiment, you may purchase a new stock of your neighbours; if not with Money, which is counted unfortunate, yet with the exchange of other Commodities. But what need we make provision against so improbable and unlikely accidents?

For the trying of Honey and Wax, we will leave to the Experienced.

There are several ways of making curious Drinks or Liquors out of Honey; some make it white and clear, not only by the pureness and fineness, and whiteness of the Honey, but also by some particular Process or Art they have: Others make it very good; yet partly by reason of the nature and colour of the Honey, and partly for want of judgment, it carries with it a more gross and red tincture: but if the Honey be good, the tincture cannot be much injurious to the Drink.

*Making of
Metheglin.*

Concerning the making whereof, we have met with some few Directions, which we shall here insert.

A Receipt to make pure Mead that shall taste like Wine.

Take one part of Clarified *Honey*, and eight parts of pure *Water*, and boil them well together in a Copper-Vessel, till half the Liquor is boiled away: but while it boils, you must take off the Scum very clean; and when it hath done boiling, and begins to cool, Tun it up, and it will work of it self: As soon as it hath done working, you must stop the Vessel very close, and bury it under-ground for three Months, which will make it loose both the smell and taste of the *Honey* and *Wax*, and will make it taste very like *Wine*.

Another Proportion.

Take of *Honey* Clarified twenty pound, and of clear *Water* thirty two Gallons: mingle them well together, and boil that Liquor half away, and take off the Scum very clean, &c. and if you will have it of an *Aromatick* taste, you may add this proportion of Ingredients: *viz.*

Flowers of *Elder*, *Rosemary*, and *Marjoram*, of each an handful; of *Cinnamon* two Ounces, of *Cloves* six Ounces, of *Ginger*, *Pepper*, and *Cardamom*, each two scruples: These will give it a pleasant taste.

Another Proportion thus.

To a dozen Gallons of the scummed *Must*, take *Ginger* one Ounce, *Cinnamon* half an Ounce, *Cloves* and *Pepper* of each alike, two Drams, all gross beaten, the one half of each being sowed in a bag, the other loose; and so let it boil a quarter of an hour more.

Some mix their *Honey* and *Water* till it will bear an Egg; by which Rule you may make it stronger or smaller at pleasure.

Another Proportion of Ingredients.

To sixteen Gallons of *Must*, take *Thyme* one Ounce, *Eglantine*, *Marjoram*, *Rosemary*, of each half an Ounce, *Ginger* two Ounces, *Cinnamon* one Ounce, *Cloves* and *Pepper* of each half an Ounce, all gross beaten; the one half boiled in a bag, the other loose, &c.

Note, That all green Herbs are apt to make your *Metheglin* flat or dead, and that *Cloves* are apt to make it high-coloured; and that scumming of it in the boiling, is not advantageous, but injurious, the scum being of the nature of *Yeast*, helping to ferment and purifie.

I forbear to add any more of the nature and ordering of *Bees*, or of the making of *Honey*, having lately written and published my *Vinerum Britannicum*, Treating of all sorts of these curious Drinks; and also *Apiarium*, or Treatise of *Bees*; to which I refer you for a more full discourse of this part of good Husbandry.

The whole time of their feeding is about nine weeks, during which time you may feed them twice a day, by laying the leaves over them, as it were to cover them, and they will soon find a way through them; and as they grow in strength, you may feed them more plentifully and often. It is good to let the leaves be clear of Dew or Rain, before you give them unto the Worms: You may keep them spread on a

THis, though but a *Worm*, yet Glorious Creature, seems by the Relation of credible Historians, to be but a Modern Operator in these Northern Countries, of that excellent Commodity *Silk*; and these also are not so much increased nor improved (especially here in England) as they might be: every one almost is willing to undergo the trouble, and enjoy the pleasure and benefit of Feeding and preserving them, were there but Food enough here for them; the deficiency whereof is the only *Remedy* that impedes this most Noble Enterprize.

The *Mulberry-leaves* are the principal, and I believe the only Food that will feed and cherish these Worms to advantage, at least in these Countries, whatever some write to the contrary; as that at *Dublin* in *Ireland* the Worms have fed on *Lettice* very readily, and that they grew as big as those that were fed with *Mulberry-leaves*, and did spin as much *Silk*, eating also no other Food; and that they will eat the Herb called *Dandelion*. Others have tryed that way of feeding them with *Lettice*, and not found the success answerable. Some also affirm, that they will thrive on *Poplar-trees*, *Plum-trees*, and *Apple-trees*; the certainty whereof we leave to be decided by experience: But I see little reason for it, the *Silk-worm* being only an *Insect*, and that it is generally the nature of *Insects* to feed on some certain specifical matter; therefore the only and principal way that is to be attempted for the propagating of this Design, is for some publick-spirited persons to lay out some certain places of their Lands for the raising of *Mulberry-trees*, as before in our discourse of *Fruit-trees* we observed.

Their Food.

About the beginning of *May* when the *Mulberry-tree* begins to spread its Leaf, is the time the *Silk-worms* Eggs are as it were by nature adapted for a release from their long confinement; that if you lay them in some window in the warm Sun, or carry them in a little Box between some pieces of *Say*, in some warm place about you, keeping them warm in the night, they will soon appear in a new Form: then cut some Paper full of small holes and lay over them, and over that some of your young *Mulberry-leaves*, and these small Worms will easily find their way to their natural Food; and so fast as they are hatched, they immediately apply themselves to the Leaves. After they are thus betaken to the Leaves, you may place them on Tables or Shelves at convenient distances, according to the number of your Worms, and proportion of place you have for them.

Time and manner of hatching Silk-worms Eggs.

They are sick four times in their feeding; the first commonly about twelve days after they are hatched, and from that time at the end of every eight days, according to the weather, and their good or ill usage: during which time of every sickness, which lasteth two or three days, you must feed them but very little, only to relieve such of them as have past their sickness before the rest, and those that shall not fall into their sickness so soon.

Their sicknesses.

The

The time and
manner of
feeding.

The whole time of their Feeding is about nine weeks, during which time you may feed them twice a day, by laying the Leaves over them, as it were to cover them, and they will soon find a way through them; and as they grow in strength and bigness, so may you feed them more plentifully and often. It is good to let the Leaves be clear of Dew or Rain, before you give them unto the Worms: You may keep them spread on a Table, in case they be wet; you may gather and keep them two or three days without any great inconvenience, in case you live remote from Mulberry-trees, or the weather prove casual.

You must observe to rid often their Shelves of their Dung, and the remainders of their Leaves, by removing the Worms when they are fast on the new Leaves laid on them; for then may you remove easily the Worms with the Leaves, the keeping clean of the Shelves, and the Room being a principal means to preserve them. Also remember to keep their Room warm in cold and wet wather, and to give them a little Air in hot weather.

Let not the Room you keep them in be too near the Tiles on the top of your House, nor in any cold and moist Room below; but be sure to avoid all extreams.

Their spinning.

When they have fed as long as they are able, they look of clear and Amber-colour, and are then ready to go to work; therefore it is then advised, that you make Arches between their Shelves with *Heath* made very clean, or with branches of *Rosemary*, stalks of *Lavender*, or such like: whereupon the Worms will fasten themselves, and make their bottoms, which in about fourteen days are finished.

But the only way that I have seen practised, and the best way, is to make small Cones of Paper, and place them with their sharp ends downwards in rows; in each of which put a Worm, as they appear to you to be ready to go to work, and there will they finish their bottom more compleat, and with less waste than on any branches whatever.

Their breeding.

When they have finished their bottoms, which will be in about fourteen days, then take so many as you intend to reserve for Breeders, and lay them by themselves, and the Worms within will eat their way out in four or five days time; and when they come forth, it is advised that you put them together on some piece of old *Say*, *Grogeram*, the backside of old *Kelvet*, or the like, made fast against some Wall or Hangings in your House; but I have known them succeed very well on Tables, &c.

Then will these *Flies* ingender, and the Male having spent himself dies, and so doth the Female after she hath lain her Eggs: then take the Eggs up with the point of a knife, or such-like, and put them into a piece of *Say*, or such like, and keep them in a Box amongst Woollen Cloaths, or such other dry, and not warm place, till the next Spring. One of these Females will produce some hundreds of Eggs; therefore a few kept for Seed or Increase will be sufficient, the residue put into an Oven after the baking of Bread, &c. that it may be only hot enough to kill the Worms; for their gnawing their way out is some prejudice to the bottom.

The winding
of the Silk.

When you have obtained your bottoms, take off the Bags; and having found their ends, put six, ten, or more in a Bason of Water together, where a little *Gum-Tragacanth* is mixed, & so you may easily wind them: The small hairs of Silk seldom break; but if they do they are easily found again. If the Worms are not well fed, the Silk is small, and easily breaks.

Another

Another way to make these Gummy bottoms wind easy, is this : Take *Soap boilers Liquor* or *Lee* which is very sharp and strong, and put therein your Bottoms, and set them over the fire till the Liquor be scalding hot, and so let the bottoms remain therein about half a quarter of an hour, till the Gummings be dissolved ; then put the Bottoms into clean scalding water, and let them lye a while therein, then will they unwind with much facility. A *Lixivium* made of Wood-ashes very strong, will do as well as the aforesaid Soap-boilers Liquor.

There is a kind of Tow, or rough sort of Silk, that will not wind up with the other ; which may be prepared, and good Silk made thereof, and indifferent also of the Bags themselves.

The fine Skeins, after they have past through the Scowlers, Throsters, and Dyers hands, may compare with the finest.

CHAP.

SECT. I.

From the Hatching of the Eggs.

CHAP. X.

Of the common and known External Injuries, Inconveniencies, Enemies, and Diseases incident to, and usually afflicting the Husbandman in most of the Ways or Methods of Agriculture before I treated of; and the several Natural and Artificial Remedies proposed and made use of for the Prevention and Removal of them.

Since the Exclusion of our First Parents out of the state of Bliss or Paradise, all our Actions, Endeavours, and Enterprises have been subject to the various and uncertain dispositions of an over-ruling Providence; and also of Fortune, and unexpected chances and accidents; and more especially the several Actions and Employments that are incident and belonging to this Noble Art of *Agriculture*, and its several branches before treated of, that no one exercised in *Husbandry* can promise himself a peculiar Indemnity from the usual misfortunes that generally attend it; which is the cause that at some time that very Commodity is dear and scarce, which at another time is cheap and plentiful; and that some Husbandmen have excellent Crops, and good success at the same time, when others have the contrary.

*A thousand Enemies, a thousand Ills,
O'er Plants prevail; sometimes the bad Air kills
The hopes o' th' Spring, and therefore you must try
With greatest care these threatening Plagues to fly.*

Rapinus.

These very considerations have not only stirred up the Ingenious to consider of the Diseases and Injuries themselves, but also to seek after the means to avoid those that of necessity attend them, and to prevent such that may be prevented: which we find dispersed in several Authors; and find to have been made use of by many of our *Modern Ingenious Rusticks*, and not yet made publick: and first we will discourse of such injuries and inconveniencies that proceed.

S E C T. I.

From the Heavens or the Air.

Great Heat or Drought in Corn-Lands. This Island is generally subject to great heat or drought in the Summer-time, which so much exsiccateth and wasteth the moisture and Vegetative nature of the Earth, that much of our common Field or open Land yields but a reasonable crop of Corn, nor our open and wide Pastures, or dry Lands, much Grass or feeding for Cattle; yet are these drier

driest Summers most propitious unto us, and in them do we reap the most copious Crops; but it is because we have so much low grounds under the Shelter, and so many Inclosures defended from the destructive and sweeping Summer Airs, where in those dry years we have our richest Harvests; so that Nature it self, and common experience, hath chalked out unto us a remedy for our dry, barren, and Hungry Lands and Pastures whether common or appropriate, against heat and drought, the two principal inconveniences attending those Lands, if we had but the hearts of Men to make use of it. It is said that in *Cornwall* they begin to practise this Husbandry, and plant Mounds and Fences with Timber-trees, which growing tall, do much preserve the Land from malignant Airs, and yield a great profit besides. See more of this remedy before in the Chapter of Inclosures.

Heat or Drought, also produces more particular inconveniences or injuries, as to Trees sown or Planted abroad in the open Fields, or in Inclosures, Gardens, &c. which is a very great check or impediment to the Husbandman in propagating them; the preventions or remedies whereof are several. In Planting of Trees.

1. In the driest and most barren Lands in *England*, if you sow the same with the Fruit or Seed of Oak, Ash, Beech, or any other wood whatsoever, you may also sow the same Land at the same time with *Broom*, *Furze*, or such like; which will wonderfully thrive on the worst of Land, and become a shelter to the other Trees; which when once they have taken sufficient Root, will soon out-strip the *Furze* or *Broom*: or you may raise Banks and sow them with *Furze*, which will soon make a Fence, under the shelter whereof you may Nurse up other Trees; for it is most evident, that the greatest Trees that grow on the barrenest Lands, had their original in the same places where they grow, and is most probable that they were thus defended by some small Bush or Brake from Cattle, Heat, Cold, &c. till they arrived to such height that they could defend themselves.

2. For such Trees that are usually planted in Hedge-rows, or other places of Inclosures, &c. which the Heat and Drought both either impede their growth, or totally kill them, to the great discouragement of the Planter; add to the Roots of them, on the Surface of the Earth, a heap of stones, which is the best Additament, and will keep the Roots and Ground about it cool and moist in the Summer, and warm in the Winter, and fortifie the Tree against Winds, &c. but where stones are not easily attained, heaps of *Fern*, or any other Vegetable, *Straw* or *Stubble*, &c. will preserve the Ground moist, and enrich it withall: but where neither Stones nor Vegetables can be had conveniently, after the Tree is planted, and good Mould or Earth added to the Roots, raise a Hillock about it of any manner of Turf, Earth, &c. for it is not the height of the Earth above the Ground about the Tree that injures it so much, as the depth of the Tree below the Surface or bare Earth.

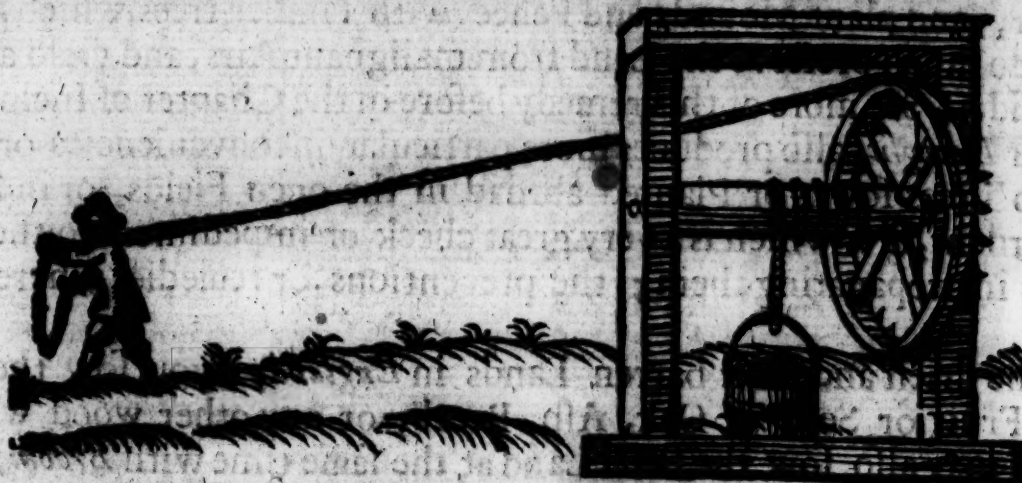
3. In Gardens, and such near places where you may be at hand, and where you have choice Plants that suffer by heat, Shadow is a principal remedy, as before we noted, or water in such places where it may be commanded.

In several places Water is the principal thing deficient to make them pleasant and profitable, and the means whereby to procure it very tedious, costly and difficult: it is several ways attainable.

1. By sinking of Wells, which where they are very deep, some use a large Wheel for Man or Beast to walk in to raise it; others use a double Wheel with Cogs, which makes draw easier than the ordinary single wheel.

Wheel; but this is not so good a way as the double Wheel with Lines, the Line of the Wheel at your hand being small and very long: this raiseth a large Bucket of Water with very much ease and security to the Winder; the Method being usual, needs no description here.

But if you have a desire to raise a great quantity of Water out of a Well in a little time, there cannot be a more expeditious way, than to make at the end of the *Winlax* a larger Wheel, that may be two or three times the Diameter of the *Winlax*, on which a smaller and longer Rope may be wound than that which raiseth the Bucket; after this manner;



So that when the Bucket is in the Well, the small Rope is all of it wound on the greater Wheel, the end whereof your Servant may take it on his Shoulder, and walk or run forward until the Bucket be drawn up: In which Operation, 1. Your Bucket may hold twenty or thirty Gallons, as you please, and yet draw up with more ease than one of seven or eight the ordinary way. 2. The Bucket may have a round hole in the middle of the bottom, with a Cover fitted to it like the Sucker of a Pump, that when the Bucket rests on the Water, the hole may open, and the Bucket fill; and as soon as you raise it, the Cover stops it immediately, which prevents the diving of the Bucket. 3. On the outer Wheel may be made Teeth, with a ledge of Wood so falling on it, that as you move forward it may not stop; but when the Bucket is as high as you intend it, then the ledge bearing against the Teeth, stops the Bucket until you come to it, after the manner of the Wheel of a Watch, Clock or Jack. 4. When the Bucket is up, you may have a Receiver by, and a moveable Trough to slip under the Bucket, than when the Cover is raised by a small cord fastened to it in the inside, the water may by it be conveyed into the Receiver. By this means many Tuns of Water may be drawn up in a little time. If your Bucket be large, or your Well deep, or the way but short you have to go, you may use a Horse.

2. By bringing Water in Pipes or Gutters, which is easily done, the Spring or Stream from whence you bring it being somewhat higher than the place where you desire it.

3. By raising water by Forcers, Pumps or Water-wheels, many and several are the Inventions whereby to effect it; but none more easy, plain and durable than the *Perrier* wheel before mentioned in the Chapter concerning the watering of Meadows.

4. By making of Cisterns or Receptacles for water, either for the Rain or some Winter Springs to fill them, whereby the water may be kept throughout the Summer. In this are we very deficient; for on the Mountains, dry, and upland parts of Spain, they have no other water than what they so preserve from the Rain.

It being the Custom in *France*, where in many places water is scarce, to preserve their waters in Cisterns, as the *French Rural Poets* advises.

*That if the place you live in be so dry,
That neither Springs nor Rivers they are nigh;
Then at some distance from your Garden make,
Within the Gaping Earth a spacious Lake,
That Like a Magazine may comprehend
Th' assembled Clouds that from the Hills descend;
And all the bottom pave with Chalkie Lome, &c.*

Also in *Amsterdam* and *Venice*, they keep their Rain-water in Cellars made on purpose for Cisterns, capacious enough to contain Water for the whole year, it being renewed as oft as the rain falls. Why therefore may we not here in *England*, on our driest Hills, make Places, Pools or Cisterns sufficient to contain Water enough for our Cattle for our Domestic uses, and also for our Garden occasions, if we were but diligent? few years there are but yield us plenty of showers to supply them, though not enough to supply the defect of them; much more Rain falling here than on the Continent where those Pools & Cisterns are more used; for which cause this Island is by them termed *Matula Caeli*; and yet have we so many thousands of Acres of dry Lands uninhabited, untilled, and almost useless unto us from this only cause, and have so easie means to remedy it.

If you design to make your Cisterns under your House as a Cellar, which is the best way to preserve it for your Culinary uses; then may you lay your Brick or Stone with *Tarris*, and it will keep Water very well; or you may make a Cement to joyn your Brick or Stone withal, with a Composition made of slacked sifted *Lime* and *Linseed-Oil*, tempered together with Tow or Cotten-Wooll.

*How to make
Cisterns to
hold Water.*

Or you may lay a Bed of good Clay, and on that lay your Bricks for the Floor; then raise the Wall round about, leaving a convenient space behind the Wall to ram in Clay, which may be done as fast as you raise the Wall: So that when it is furnished, it will be a Cistern of Clay walled within with Brick; and being in a Cellar the Brick will keep the Clay moist (although empty of Water) that it will never crack. This I have known to hold Water perfectly well in a shadowy place, though not in a Cellar. Thus in any Gardens or other places, may such Cisterns be made in the Earth, and covered over, the Rain-water being conveyed thereto by declining Channels running unto it, into which the Alleys and walks may be made to cast their Water in hasty showers. Also in or near Houses, may the Water that falls from them be deducted thereunto.

But the usual way to make Pools of Water on Hills, and Downs for Cattle, is to lay a good Bed of Clay, near half a Foot thick, and after a long and laborious ramming thereof, then lay another course of Clay about the same thickness, and ram that also very well: then pave it very well with *Flints*, or other *Stones*, which not only preserves the Clay from the tread of Cattle, &c. but from chapping of the Wind or Sun at such times as the Pool is empty. Note also, that if there be the least hole or chap in the bottom, it will never hold Water, unless you renew the whole labour.

Some have prescribed ways for the making of Artificial Springs, others for the making of Salt-water fresh; but those things being not yet fully experienced, we leave, being not willing to trouble our Husbandman with so great Philosophical intricacies, tending rather to lead him from the more plain and advantageous Method to imaginary and fruitless attempts.

*Great Cold
and Frost.*

Heat and Drought do not always attend us, nor do they so frequently afflict us, especially in the greatest part or proportion of this Countrey, but that we have also a share of a superabundant Cold and Moisture: but seeing that they do not so frequently happen together as Heat and Drought usually do, we will divide them. The Cold that most afflicts the Husbandman, is the bitter Frosts that sometimes happen in the Winter or Spring.

*At the end of Spring when welcome Heat returns,
When ev'ry Garden lovely Fruit adorns,
Sometimes a Tree by sudden Tempests frost
The whole years hopes in one short night has lost.*

And are beyond our power either to foresee or prevent; yet that they may not injure us so far as otherwise they might, we propose these remedies or preventions.

Some Land are more inclinable and capacitated by their nature or situation to suffer by bitter Frost, than others are; as those that lie on a cold Clay or Chalke, more than those that lye on a warm Sand or Gravel; those that lie moist, than those that lye dry; those that lye on the North or East-sides of Hills, than those that lye on the South or West: therefore it is good to Plant or sow such Trees, Grains or Plants, that can least abide the Cold in such Grounds that are most warmly seated.

And although it is not an easie thing to alter the nature of the Ground, yet it is feasible to take away the offensive moisture that doth so much cool the Land, whereof more hereafter in this Chapter; and also to place such Artificial Defensives against the Cold, that may very much remedy this inconvenience; as we see it is most evident, that the Frosts have a greater influence where the Air hath its free passage, than where it is obstructed: To which end we cannot but propose Inclosures and planting of Trees as a remedy also for this Disease; for any manner of shelter preserves the Corn, young Trees, &c. from the injury that otherwise would happen to them; as we see in snows, and drowning of Meadows, that the Snow and Water prove defensive against the Cold.

In Gardens, and other nearer Plantations, the Spring-Frost prove most pernicious; the general remedies whereof, where the site and position of the place is not naturally warm, are Walls, Pales, or other Edifices, or tall Hedges or rows of Trees, whereof the *Whitethorn*, but chiefly *Holly* have the preheminnence: but these seem remote, and rather preventions against the Wind; the more nearer are the application of new Horse-dung, or Litter that hath lain under Horses, which applied to the Roots or any tender Trees or Plants, preserves them from the destructive Frosts; and also by covering the whole Beds therewith, preserves the Plants or Root therein: Also *Saraw*, *Hawn*, *Fern*, or such-like dry Vegetable, will defend any thing from the Frosts, although the Litter be to be preferred.

But

But such things that are not to be touched or suppressed, as *Coleflower-plants*, *Gillyflower-slips*, &c. the placing of Sticks like some Booth, or such like over them, and covering them with a Mat or Canvas, or such like, doth very much defend them; giving them Sun and Air in temperate days, makes them the more hardy, and preserves their colour.

Furze where it may conveniently be had, is a very excellent shelter and defence against Cold, being laid about Trees, or over Plants of what kind soever: It breaks the violence of Wind and Frost beyond any thing else; lying hollow of it self, doth not that injury to Plants that other things do without support; and proves many times better than a supported shelter.

Preserving them also from Rain, unless as much as is sufficient to nourish them, is a good prevention of Frosts; for the Frost injureth no Plant so much as that which stands wet, as I have often observed, that *Cypress-trees* & *Rosemary* standing on very dry ground, have endured the greatest Frosts, when others have perished by the same Frosts standing in moist ground, although more in the shelter. Also the most pernicious Frosts to Fruits succeed rainy days; a dry Frost rarely hurts Fruit.

Gilliflowers, and several other Flowers and Plants, receive their greatest injury from wet; which if kept dry, endure severe Colds the better.

Hot Beds are much in use for the propagating of Seeds in the Spring, &c. which when they are covered, prove secure remedies.

Conservatories wherein to remove your tender Plants in the Winter, are a usual prevention of Cold; some whereof are made by some degrees warmer than others are, suitable to the several natures of the Plants to be preserved.

But the compleatest *Conservatories*, are large leaves of Boards to open and shut at pleasure over your *Orange* or other Fruit-trees, closely pruned against a Wall or Pale, and Planted, either against your Chimney where you always keep a good Fire, or against some Stove made on purpose. *Aprerocks* so planted against an ordinary Wall with such doors, must needs avail much in the Spring-time, to defend the young and tender Fruit from the sharp Frosts; and is a much more practicable and surer way, then the bowing the Branches into Tubs, as some advise: Others hang Cloaths or Mats over the Trees in Frosty nights; but these are troublesome.

It is evident, that part of the same Tree being under some shelter from the Rain will bear plenty of Fruit, when other part of the same Tree, being open to the Rain, bears but little in cold and destructive Springs, though alike obvious to the Cold and Wind: Therefore endeavour to preserve your tender Wall-fruits from the Wet, and you may the less fear the Wind and Cold.

To lay open the Roots of Trees in the Spring to keep them backwards from springing, is a very proper invention against the Frosts in Apples, Pears, &c. for we find a forward Spring that excites the early Fruit too soon, proves very injurious to it, in case any Frosts succeed.

The freezing of water proves sometime an injury to the Husbandman, either by hindring his Cattle from drink, or by destroying Fish that are confined in a small Pond so frozen: to prevent the latter, if you can, let there be some constant fall of Water into it, though never so small, which will always keep a vent open, sufficient to preserve the Fish, who
can

can as ill live without Air, as Terrestrial Creatures can without Water. Any constant motion prevents a total Congelation.

If you lay a good quantity of Peaf-hawm in the Water, that part may lie above, and part under the Water, it is observed that the Water freezes not within the Hawm, by reason of its close and warm lying together; which will prevent the death of Fish, as well as breaking of the Ice.

Fruit when it is gathered into the House, is subject to be spoiled by Frosts; therefore be carefull to lay it in dry rooms, either Ceeled, Thatched, or Boarded; for in Frosty weather the condensed Air, which is most in such Rooms adhering to the Fruit, freezeth, and destroyeth it; which is usually prevented, covering them with straw, &c. but best of all by placing a Vessel of Water near them, which being of a colder nature than the Fruit, attracts the moist Air to its self, to the preservation of the Fruit, even to admiration.

Much Rain.

Great Rains prove injurious to such lands that are of themselves moist enough: for the remedy whereof, and to prevent such injuries, see more in the next Section.

In such Lands that lye at the bottoms or foot of Hills, where the great falls of Rain do annoy the Corn or Grasse, care is to be taken for the conveying away of the Water by Channels or Passages made for that purpose.

In the time of Harvest the greatest enemy the Husbandman usually finds is Rain, against which, the best remedy is Expedition; *To make Hay whilst the Sun shines.*

It is a grand neglect that there are not some kind of Artificial shelters made in Lands remote from our dwellings, for the speedy conveyance of Corn into shelter in dripping Harvests; & there to remain till fair Weather and leisure will admit of a more safe carriage.

Worthy of commendation is the practice used in *Somersetshire*, &c. where they lay their Wheat-sheaves in very large shocks or heaps in the Fields and so place them, that they will abide any wet for a long time; when on the contrary in *Wiltshire*, and other more Southernly Counties, they leave all to the good or bad weather, though far remote from Barns, sometimes to their very great detriment; so naturally slothfull and ignorant are some people, and naturally ingenious and industrious are other.

Where their Lands lye two or three miles from their Barns, as in some places in Champion Countries they do, the covered *Reekstaval* (much in use *Westward*) must needs prove of great advantage in wet or dry Harvests, to save long draughts at so busie a time.

Where Lands lye at a far distance the one from the other, several Barns built as the Land requireth, are very convenient for the more speedy housing of the Corn, for the better preserving of it, the more easy thrashing it out, the more convenient fothering of the Cattle with the Straw, and for the cheaper disposing of the Soil for the improvement of the Land; where on the contrary, one great Barn cannot lye near to every part of a large Farm, nor can Corn be so well preserved in it, nor with so much advantage disposed into Mows, nor thrashed, nor the Fother, nor Soil so easily dispersed.

High

High-winds prove very pernicious and injurious to the Husbandman in several respects, to his Buildings, Fruits, Trees, Hops, Corn, &c. as many in the plain, open, or high Countreys, by wofull experience do find: To prevent which as to Buildings, by common experience and observation we find, that Trees are the only and most proper safeguard; for which the *Eugh* is the best, although it be long a growing. Next unto that the *Elm*, which soon aspires to a good height and full proportionable body, and is thickest in the Branches, and will thrive in most Lands; but any Trees are better than none. As to Fruits, Walls, Pales, or any other Buildings, are a good prevention and security for Garden-fruits; but for want of that, Hedges and rows of Trees may be raised at an easie rate, and in little time.

As to Timber, or other Trees, which are also subject to be subverted or broken by high winds, to abate the largeness of their Heads, proves a good prevention, especially the *Elm*, which ought to have its Boughs often abated, else it will be much more subject to be injured by high Winds than any other Tree.

Hops, of any Plant the Husbandman propagateth, receiveth the most damage from high Winds, which may in some measure be prevented. Against the Spring-winds, which nips the young Buds, and afterwards bloweth them from the Poles, a good Pale or Thorn-hedge much advantageth; but against the boisterous Winds, when they are at the tops of the Poles, a tall row of Trees encompassing the whole Hop-garden is the best security in our power to give them. Also be sure to let their Poles be firm and deep in the ground.

As to *Corn*, Wind sometimes proves an injury to it in the *Ear*, when they are accompanied with great Rains, by lodging of it: but the greatest injury to it is in the *Grass*, when it is young, (I mean Winter-Corn) the fierce bitter blasts in the Spring destroying whole Fields: The only and sure remedy or prevention against this Disease is Inclosure, as before we noted of Cold.

In *Spain*, &c. where the Mist of Superstition hath dimmed the Spiritual and Natural Sight, the Ringing of Sacred Bells, the use of Holy-water, &c. are made use of to charm the evil Spirit of the Air, which very frequently in those hotter Climates terrifies the Inhabitants, that he may be a little more favourable unto them than others: But it cannot enter into my thoughts or belief, that any thing we can do here, either by Noises, Charms, &c. or by the use of *Bays*, *Laurel*, &c. can prevail with so great a Natural Power, and so much beyond our Command: Prayers unto God excepted, which are the only Securities and Defensives against so Potent and Forcible Enemies.

*High Winds.
Thunder and
Tempest.
Hail, &c.*

Blighting and *Mildews* have been generally taken to be the same thing, which hath begotten much error; and the ways and means used for the prevention and cure, have miscarried through the Ignorance of the Disease; For

Mildew is quite another thing, and different from *blighting*. *Mildews* being caused from the Condensation of a fat and moist Exhalation in a hot and dry Summer, from the Blossoms and Vegetables of the Earth, and also from the Earth its self; which by the coolness and serenity of the Air in the night, or in the upper serene Region of the Air, is condensed into a fat glutinous matter, and falls to the Earth again; part whereof rests on the Leaves of the Oak, and some other Trees whose Leaves are smooth

Mildews.

smooth, and do not easily admit the moisture into them, as the *Elm* or other rougher Leaves do; which *Mildew* becomes the principal Food for the industrious Bees, being of its self sweet, and easily convertible into Honey.

Other part thereof rests on the Ears and Stalks of Wheat, bespotting the Stalks with a different (from the natural) colour; and being of a glutinous substance by the heat of the Sun, doth so bind up the young, tender, and close Ears of the Wheat, that it prevents the growth and completing of the imperfect Grain therein; which occasioneth it to be very light in the Harvest, and yield a poor and lean Grain in the Heap.

But if after this *Mildew* falls, a showre succeeds, or the Wind blow stiffly, it washeth or shaketh it off, and are the only natural Remedies against this sometimes heavy Curse.

Some advise in the morning, after the *Mildew* is fallen, and before the rising of the Sun, that two Men go at some convenient distance in the Furrows, holding a Cord stretched streight betwixt them; carrying it so that it may shake off the Dew from the tops of the Corn, before the heat of the Sun hath thickned it.

It is also advised to sow Wheat in open grounds, where the Wind may the better shake off this Dew; this being looked upon to be the only inconvenience Inclosures are subject unto: but it is evident that the Fieldlands are not exempt from *Mildews*, nor yet from Smut where it is, more than in Inclosed Lands.

The sowing of Wheat early hath been esteemed, and doubtless is the best remedy against *Mildews*, by which means the Wheat will be well filled in the Ear before they fall, and your increase will be much more: As for curiosity sake, Wheat was sown in all Months of the year: that sown in *July* produced such an increase that is almost incredible. In *France* they usually sow before *Michaelmas*.

Bearded-Wheat is not so subject to *Mildews* as the other, the Fibres keeping the Dew from the Ear.

Hops suffer very much by *Mildews*; which if they fall on them when small, totally destroy them. The remedies that may be used against, is when you perceive the *Mildews* on them, to shake the Poles in the morning.

Or you may have an Engine to cast Water like unto Rain on them, which will wash the *Mildew* from them: And if you have Water plenty in your Hop-Garden, it will quit the cost, in such years Hops being usually sold at a very high rate.

SECT. II.

From the Water and Earth.

Next unto those *Aerial* or *Celestial* injuries which descend upon us, we shall discourse of such that proceed from the Water and Earth, that do also in a very great measure at some times and in some places afflict us, proving great impediments to those Improvements that might otherwise be easily accomplished, and also great detriments unto the Country-man upon that which he hath already performed.

As the want of water in some places proves a great impediment and injury to the improvement and management of Rustick Affairs, so doth the superabundant quantity; either from the flowings of the Sea over the low Marsh-Lands at Spring-tides and High-waters, or from great Land-floods, but principally from the low and level situation of the Land, where it is subject to Springs, Over-flowings, &c. Much water offending.

It is evident that much good Land hath for many ages yielded little benefit, by reason of the high waters that sometimes have covered it over, and destroyed that which in the Intervals hath grown; and hath also over-flown much good Land so frequently, that it hath become useless: but by the extraordinary charge, labour, art and industry of some publick-spirited persons, very great quantities thereof have been gained from power of the Grand Enemy to Husbandry, as may be observed in those vast Levels of rich Land in *Lincolnshire* and *Yorkshire*, *Cambridgeshire*, &c. in our Age recovered. Many other vast Flats and Levels there are on the Borders of this Kingdom, that are beyond the power, strength, or interest of a private Purse to attempt, yet to the Publick at a publick charge would redound to an infinite advantage, & not only maintain thousands at work (employment being the greatest check to factious spirits) but bring in a yearly increale of Wealth, one of the principal Supports of this Kingdom against its Enemies, and that without the hazards of an *Indian Voyage*. Overflowing of the Sea.

Land-floods in some places, especially on the great Flats and Levels, prove a great annoyance to the Husbandman, that it is of equal concernment to divert the Land-floods from some Lands, as to drain the Water that resides upon it, and otherwise annoys it. Land-floods.]

As we see in the Draining the great Level between *Yorkshire* and *Lincolnshire* by the Isle of *Axholm*, where the great River *Idle*, Navigable of its self, that formerly passed with its great Land-floods through the vast Level on the *Yorkshire* side of *Axholm*, by the Art and Industry of the Drainers, through a new Cut, is carried into *Trent* on the other side of the Isle; that the Draining of that great Level, which otherwise might seem impossible to be done, by that very means became most feasible; So that here we need say no more, but that as the conveniency of the place will permit, you divert the Land-floods and Streams before you attempt a through Draining, if it be feasible and requisite, lest you multiply your cost, and be at last frustrate of your purpose.

The greatest of our In-land Annoyance to Husbandry, occasioned by Water, is from the standing or residing of Water on our flat and level Marshes, Meadows, or other Lands, whether occasioned from Rains, Springs, or otherwise. Standing Waters.

Where there is any descent or declining of Land, by cutting Drains to the lowest part, it is most easily performed.

But where it is absolutely flat and level, it is much more difficult; yet are there few such Levels, but there are places or Currents for the Water to pass out of them; which you must sink deep and wide enough to Drain the whole, and then make several Drains from each part of the Marsh or Level, beginning large and wide at the mouth of the Drain, and lessening by degrees, as it extends to the extremities of the Land you drain. Be sure to make the Drains deep enough to draw the Water from under the Marsh or Bog, and make enough of them that may lay it thoroughly dry.

If you cannot make a passage deep enough to take the Water away from the bottom of your Drain, which in many places is an Impediment of this improvement, either by reason that you cannot cut through another's Land, or that the Passage be long, or that some River is near, which will be apt to revert upon you, or such like, then may an Engine commanded by the wind be of great use, and effect that which by any other way could not be done; the description whereof see before in the third Chapter. According to the height you raise the Water, may you proportion the greatness or smallness of your Engine. You need not fear Wind sufficient at one time or other to keep your Drains empty: for during the greatest Calms, are usually the greatest Droughts; and in the wettest Seasons winds are seldom wanting, especially on Flats and Levels.

Over-much moisture proves very injurious to Corn, and other Plantations; the usual remedy whereof is to lay the Land high in Ridges, and cut Drains at the ends of the Furrows to carry away the superfluous Water.

It is observable that after a wet Summer Corn is very apt to be blighted. The reason is, that the over-much Moisture that lyeth continually at the Roots of the Corn, maketh it run much to Straw, and little to Corn; and at such time as the Corn should kerne, the moist Vapours exhaled by the Sun from the wet grounds, do in the nature of a Mildew prevent the due growth of the Grain in the Ear.

And it is observable that when these Mildews arise or Blights fall, that they infect one sort of Grain generally, as sometimes only Wheat, sometimes Oats, &c. The like happens amongst Fruits: Sometimes Apples are generally blasted, sometimes only Pears, sometimes only Cherries, Walnuts, Filberds, Plums, &c. like the Murrain in Cattle, infecting only that Species.

In Orchards and Gardens Moisture usually hinders the growth and prosperity of Trees and other Plants, against which, the best remedy is to double the Land; that is, by abating the one half thereof about a foot more or less, according to the Nature and goodness of the Soil, in long Walks or Rows, about seven or ten foot broad, as to you seems best and most convenient, and cast it on the other in Banks and Borders; so that you will then have those Banks lie dry to the bottom of your Walks, and all the best of the Mould, on which you may Plant your Trees, &c. where they will thrive as well as on any other drier Land, being Planted shallow.

Take this as a general Observation in Agriculture, that most of the barren and unimproved Lands in England are so, either because of Drought, or the want of Water or Moisture, or that they are poisoned or glutted with too much: therefore let every Husbandman make the best use of that Water that runs through his Lands, and by preserving what falls upon his Lands, as we have at large before directed in this Treatise, and drain or convey away that which superabounds and offends; then would there be a far greater plenty of all manner of Tillage or Cattle, to the great enriching of this Kingdom.

Water is also very offensive in our Dwelling-houses, that we cannot make Cellars for Beer, &c. which may be several ways Cured or prevented.

Either by laying the bottom and sides of the Cellar with Sheet-Lead, and a Floor of Boards thereon to preserve it from injury. Several such Cellars

Cellars there are in some Cities and Towns that lie low in the Waters ; but this is too costly a way for our Husbandman.

Another way is to joyn your Bricks or Stone with *Tarris*, or the *Cement* before described in this Chapter for the keeping Water in *Cisterns*.

Also you may Bed your Cellar with Clay, and then Brick or Stone it over, after the same manner as we directed before in this Chapter for the keeping of Water, &c.

Or you may sink a Well or Pit near your Cellar, and somewhat lower than it, into which you place a Pump, that at such times as water annoys you, it may by that means be removed.

Sometimes it happens that the Floor of the House you live in, or the Barn you lay your Corn in, are damp or moistened by certain Springs, that sometimes or other do annoy them, to your great detriment, as well to your health, as injury to your Goods or Corn; which if the situation of the place will bear it, as most usually it will, the cutting of a Trench or Ditch round about the same, of such depth as you may drain it dry by the fall that is naturally from it, will cure this Disease. This Ditch or Trench may be paved, walled on the sides, and covered as you please; so that the Brick or Stone of the Wall on the side next the House or Barn be not laid with Mortar, to prevent the issue of the Water from the Earth in to it.

Much Land there is in *England* that is capable of a very great improvement, by removing those common and stubborn Obstacles, as Stones, Shrubs, Goss, Broom, &c. which are naturally produced in many places; and the faint-hearted, lazy, and sometimes beggerly Husbandman, had rather let them grow, and suck out the Marrow and Fat of his Land, than bestow any cost or pains to remove them, and is contented with now and then a bundle of Bulhes, &c. when the removal of them would not only be an improvement of his Land by their absence, but the materials themselves, by a right and judicious way of ordering them, might become an additional improvement.

As first of *Stones*, which being picked up, and laid on heaps about the Roots of either Fruit or Timber Trees planted on the Bounds, and in Rows on the Land, is a very great help and advantage to the growth of such Trees, and saves the labour of carrying them off the ground; which charge usually exceeds the charge of pricking them up: this only where Stones offend, or are injurious.

Shrubs, Goss, Broom, &c. prove a very great annoyance to Husbandry; and the difficulty and charge in plucking them up is the principal impediment to their removal, to such that are ignorant of the most dextrous ways used to that purpose; the best whereof I find to be this, described by Mr. *Plat*, viz. a very strong Instrument of Iron, like unto a Dung-fork, with three grains or Tines, only much bigger, according to the bigness of the Shrubs you use it about; the upper part thereof is a very strong and long *Stail*, or handle, like a Leaver. Now set this Instrument at a convenient distance from the Root slopewise, and with a Hedging-beetle drive it in a good depth; then lift up the *Stail*, and place under it across an Iron-bar, or such little *Fulcrum*, to keep it streight, and that it sink not into the ground.

Then take hold of the Cord that before ought to have been fastened to the top of the *Stail*, and by that means may you Eradicate any Shrubs, &c. If it will not do at once, place it on the other side, &c.

See the form of this Instrument in the Plate at the beginning of the Third Chapter.

These *Rushes, Brakes*, and such like, though they are of little worth or use for any other thing, yet are they very necessary and beneficial to improve the Land by burning them, being dry, either by themselves, or under heaps of Turf, Earth, &c. as before we observed.

Chap. 5.
Weeds.

Some Lands are more prone & subject to Weeds, and that in some years more than other, which is often occasioned by water standing on it, destroying the Corn and such Seeds that are usually sown in it, and nourishing such Weeds that most delight in moisture; the only remedy whereof is to lay it dry, and add some convenient drying and lightning materials or composts thereon, as *Sand, Ashes, &c.*

Also some sorts of Dung or Manures cause Weeds, as Dung made of *Straw, Hamm, Fern*, or such like, laid on Lands in any great quantity, without any other mixture of *Horse-Dung, Sheeps-Dung, Lime, Ashes*, or such like hot Compost, which do in some measure correct the cold and sluggish quality of it; but in some years, and on some Lands, any ordinary cold Dung begets Weeds, which injure the Corn more than the fatness of the Dung advantages; therefore *Lime, Marle, Chalk, Ashes, &c.* are to be preferred in most Lands.

Chap. 5.

Weeds in Pasture-lands are best destroyed by burning of it in Turfs, (as before we discovered) or by Plowing of it without burning.

Rushes,
Flags, &c.

Rushes, Flags, and such like Aquaticks, are best destroyed by draining; so that you cut your Drains below the Roots thereof, that it may take away the matter that feeds them.

Thistle.

The *Thistle* proves a great annoyance to some Lands, by killing the Grass, Corn, &c. although it be a sure Token of the strength of the Land: The way to destroy them, is to cut them up by the Roots before feeding time; the advantage you will receive will answer your expence, and more.

Fern.

The way to destroy this so common and known an annoyance, is to Mow it off in the Spring, whether with an Iron or Wooden Sythe, it matters not, for it will easily break; which work reiterate the same year as fast as it grows, and it is confidently affirmed, that it will kill & destroy the *Fern* for ever after.

Improvement and bettering the Land by *Soyling, Marling*, or *Liming*, &c. is also a principal remedy against all manner of *Broom, Furze, Heath*, and other such like trumpery, that delight only in barren Lands.

Blights and
Stalks.

Very much differing from *Mildews* is the blighting of Corn, the *Mildew* proceeding from a different cause, and happening only in dry Summers, when on the contrary *Blighting* happens in wet, and is occasioned through the too much fatness, and rankness in Land; as is observed that strong Lands are usually sown with *Barley, Pease*, or such like, to abate the fertility thereof before it be sown with *Wheat*, which would otherwise be subject to *Blights* or *Blasting*.

Wheat sown on level or low Land, in moist years is subject to the same inconveniences; for you may observe, that the *Wheat* that grows on the tops of the *Ridges*, in moist years, is better and freer than what grows in the *Furrows*, which is usually blighted by means of water and fatness lying more about it than the other; for *Wheat* naturally affects to be kept dry on moist and strong ground: Therefore as moisture, and the richness of the ground together, occasions this disease, by knowing thereof you may

may easily remedy it, by laying your Land on high Ridges: which if it be never so rich, the Wheat growing thereon will hardly be blighted, if not overcome with Moisture.

Smut seems to proceed from the same cause: therefore need we to say the less.

Only that sometimes smuttness proceeds from other causes, as by sowing of *Smutty-corn*, by sowing the Land with rotten Vegetables, as *Straw*, *Hamm*, *Fern*, &c.

It is confidently affirmed, that the smutty Grains of Wheat being sown, will grow and produce ears of Smut: But I confess I have not yet tryed, and shall therefore suspend the belief thereof till I have.

The sowing of Wheat that is mixed with Smut, doth generally produce a smutty Crop (whether the Smut it self grow or not) unless it be first prepared by Liming of it, which is thus done: First, slack your Lime, and then moisten your Corn, and stir them well together, &c. and sow it.

Or by steeping of it in *Brine*, either of which are good preventions against the Smut.

You may also prepare the ground by *Liming*, or other ways of enriching it, with sharp or saline Dungs or Soils, and it will produce Corn free from Smut; for it is most evident, that Land often sown with the same Grain, or much out of heart, produces a smutty Crop, as may be easily perceived where the same Seed hath been sown on two sorts of Land of different goodness, the one Crop hath been smutty, the other free; so that smuttness seems to be a kind of sickness incident to Corn, which may by the aforesaid means be cured; which if the Smuts themselves would really grow, and produce Smut again, all Remedies proposed, and attempts to that purpose, were needless.

SECT. III.

From several Beasts.

Against the *Traspasses* of *Domestick Cattle* breaking out of your Neighbours ground into yours, its needless to say any thing, every one knowing that a good and secure Fence is the best prevention, and a Pound the best remedy or cure, if the other will not serve. But other Beasts there are that no ordinary Fences will keep out, and will hardly be brought to the Pound.

As *Foxes*, which usually torment the laborious Husbandman, by taking away and destroying his *Lambs*, *Poultry*, *Grass*, &c. that in some places near great Forrests and Woods, they can hardly keep any thing but under Lock and key; against which Gins are usually made use of; which being baited, and a Train made by dragging raw flesh across in his usual Paths or Haunts unto the Gin, it proves an inducement and a snare to excite him to the place of destruction.

A Fox will prey on any thing he can overcome, and feeds on all sorts of Carrion; but the Food he most delights in is *Poultry*. He proves injurious and destructive to *Coney-warrens*, and destroys *Hares* also, whom he taketh by his subtilty and deceit.

They

They may be taken with Greyhounds, Hounds, Terriers and Nets, as well as Gins.

It is a very commendable and noble Exercise in our Nobility and Gentry, to Hunt these destructive Beasts; and did they prosecute it at their breeding times, and at other times also, with an intent to destroy the whole Breed or Kind, there would soon be an end of them.

Otters.

The Otter is a pernicious destroyer of Fish, either in Pond or Brook, and her abode is commonly under the root or stem of some Tree near the Water, whence she expects her Food; By her diving and hunting under water, few Fish are able to escape her.

They are taken either by insinuating them under the water by the Rivers side, as you may do a Hare on the Land with Hare-pipes; or by hunting them with Dogs, where you may make use of the Spear.

Coneys,
Hares, &c.

In several places the Husbandman suffers much by Coneys and Hares that feed down his Corn, &c. when it is young, especially in hard Winters: and in many places they have not liberty to secure their own from them.

The Hare is no great destroyer of Corn; yet where there are many of them, the Countryman may lessen their number as he sees cause; either by Hunting or Coursing them at seasonable times, or by setting of Hare-Pipes, where he finds their Haunts; or by tracing them in the Snow.

Coneys are destroyed or taken, either by Ferrets & Purse-Nets in their Buries, or by Hayes, or by Curs, Spaniels, or Tumblers bred up for that sport, or by Gins, Pitfalls, or Snares, which some ingenious Countrymen will prepare; the goodness of the Game, rather than the prevention of the damage, prompting them thereto.

Pole-cats,
Weasels and
Stoles.

It is not a little injury these Animals do to Warrens, Dove-houses, Hen-roosts, &c. but the ways by taking them in Hutches, and in small Iron-gins like Fox-gins, are so well known, that I need say nothing of it.

Only that to prevent Poll-cats, or such like, from destroying your Pigeon-house, be sure, if you can, to erect it where you may have a Ditch or Channel of Water to run round it, and it will keep those Vermine from making their Burroughs under the ground.

Moles or
Worms.

Moles are a most pernicious Enemy to Husbandry, by loosening the Earth, and destroying the Roots of Corn, Grass, Herbs, Flowers, &c. and also by casting up Hills, to the great hinderance of Corn, Pastures, &c.

The common and usual way of destroying them is by Traps that fall on them, and strike the sharp Tines or Teeth through them; and is so common, that it needs no description.

But the best and compleatest sort of instrument to destroy them that I have yet seen, is made thus: Take a small board of about three Inches and a half broad, and five Inches long: on the one side thereof raise two small round Hoops or Arches, one at each end, like unto the two end-Hoops or Bails of a Carriers Waggon, or a Tilt-boat, capacious enough that a Mole may easily pass through them: in the middle of the board make a hole so big that a Goose-quill may pass through; so is that part finished: then have in readiness a short stick, about two Inches and a half long, about the bigness that the end thereof may just enter the hole in the middle of the board. Also you must cut a Hasel, or other stick about a yard, or yard and half long, that being stuck into the ground, may spring up like unto the Springs they usually set for Fowl, &c. then make a link of

Horse-hair

Horse-hair very strong, that will easily slip, and fasten it to the end of the stick that springs: Also have in readiness four small-hooked sticks; then go to the Furrow or Passage of the Mole, and after you have opened it, fit in the little Board with the bended Hoops downwards, that the Mole when she passes that way, may go directly through the two semi-circular Hoops: Before you fix the Board down, put the Hair-spring through the hole in the middle of the Board, and place it round, that it may answer to the two end Hoops, and with the small stick (gently put into the Hole to stop the knot of the Hair-spring) place it in the Earth in the passage, & by thrusting in the four hooked sticks, fasten it, and cover it with Earth; and then when the Mole passes that way, either the one way or the other, by displacing or removing the small stick that hangs perpendicularly downwards, the knot passes through the hole, and the Spring takes the Mole about the Neck. Though this description seems tedious, yet the thing is very plain, & easily performed, and much cheaper, surer, and feasible than the ordinary way.

Others destroy them very expeditiously by a *Spadde*, waiting in the Mornings when they usually stir, & immediately cast them up; especially about *March* when they breed, by turning up the Hills whereunder they lay their Young, they usually making their Nests in the greater Hills, and are most easily discerned: then also will the Old ones come to seek their Young, which you may presently take.

The *Pot-trap* is by some much commended, which is a deep Earthen-Vessel set in the ground to the brim in a Bank or Hedge-row; which wisely set and planted at all times, but especially in the natural season of Bucking-time, about *March*, will destroy them insensibly.

Also where *Moles* annoy your gardens, Meadows, or such places where you are not willing to dig or much break the ground; fuming the holes with Brimstone, Garlick, and other unfavoury things, will drive them out of the ground that was before infested with them.

But the putting a dead Mole into a common Haunt, will make them absolutely forsake it.

Every Countryman almost is sensible of the great Injuries and annoyances they receive from these Vermine, both in the Fields where they raise Nurseries of Trees, in their Gardens where they sow and plant Beans, Pease, &c. and in their Houses, Barns, and Corn-reeks. Mice or Rats

In the Fields, Orchards, Gardens, &c. I know no readier way to destroy them, than by placing an Earthen-Pot in the ground, and covering it with a board, with a hole in the middle thereof, and over the board to lay *Hay* or such like rubbish, under which the Mice seek for Shelter, and soon find their Trap to receive them.

The usual way of building reeks of Corn on *Screens* set on stones, is the only prevention against Mice, and has proved so successful, that in some places large Edifices are built on such stones, that they supply the defect of Barns, being covered like them.

Granaries also I have seen built after the same manner: Binns or Hutches for Corn may be placed on Pins like the other, and prove secure places for Corn against these pernicious Vermine; but great caution must be used that no Stick, Ladder, or other thing lean against these places, lest the Mice find the way to come where you would not have them.

In your Flower-gardens, *Apiary*, or in the several Rooms of your House, Traps may be placed to destroy them, unless where you can conve-

conveniently keep a Cat, the only Enemy and destroyer of Mice & Rats. *Arsenick*, or the Root of *White hellebor* will destroy them, being given with Sugar or such like mixture: the last is the best, because it destroys only Rats and Mice.

S E C T. II.

From Fowl.

As the best of Contents this World affords hath its part or share of trouble and vexation, so this pleasant and excellent *Rustick Life* and *Employment* is not free from care and trouble how to preserve it self from those Enemies and Plagues that daily attend it: Sometimes the *Heavens* frown, the *Waters* swell, the *Bryers* snarle, the *Wilde-beasts* are envious at our innocent and most delectable enjoyments; and if these withdraw their evil influence, yet have we the Fowls of the *Air*, *Insects*, and several other Evils to encounter withall; which without our diligent care and industry, are ready to bereave us of the best part of the Fruits of our labours.

Kites,
Hawks, &c.

As we frequently observe that *Kites*, *Hawks*, and other Birds of Prey, wait for Pigeons, Chickens, tame Pheasants, &c. therefore is it very necessary that the Countryman keep a good Fowling-piece, ready Fitted and Charged, which is the best means to destroy and scare them away.

Also you may place small Iron-gins, about the breadth of ones hand, made like a Fox-gin, and baited with raw Flesh, whereby I have caught very large Hawks.

Also by the streining of Lines, or pieces of Nets, over the places where you keep tame *Pheasants*, *Chickens*, or such like, you may fray them away.

The cutting down of Trees about your Pigeon-house will keep them from haunting it so much as otherwise they would do.

Crows and
Ravens.

Crows, *Ravens*, *Rooks*, and *Magpies*, are great annoyances to Corn, both at Seed-time, pulling it up by the Roots whilest it is young, and feeding on it also at the Harvest; a good Fowling-piece is the best Instrument for the present: but the only way to destroy the kind of them, and make their Flocks a little thinner, were by some publick Law to encourage the destruction of their Nests & Young, which are so obvious at the building-time, that it seems to be a very feasible Work, and much to be preferred before *Crow-nets*.

Several pretty Inventions of Scare-Crows there are to keep the Corn free from them, amongst which this is esteemed the most effectual; *viz.* To dig a hole in some obvious place, where the *Crows*, &c. annoy your Corn; let it be about a foot deep, or more, and near two foot over, and stick long black feathers of a Crow, or other Fowl, round the edges thereof, and some also in the bottom. Several of these holes may be made, if your ground be large; and where these holes are thus dressed, the *Crows* will not dare to feed. I presume the reason is, because whilest they are feeding on the ground, the terrifying Object is out of their sight; which is not usual in other Scare-Crows, wherewith in a little time they grow familiar, by being always in view.

Dead

Dead Crows, &c. hang'd up, do much terrifie them; but amongst Cherry-trees, and other Fruits which are much prejudiced by the Crows, &c. draw a Packthread or small Line from Tree to Tree, and fasten here and there a black Feather, and it is sufficient.

Geese have been excluded the Corn-fields for many ages, as *Virgil* has advised the same, by reason of their treading & feeding on the young Corn.

Pigeons are a Fowl that bring great advantage to their Owners, but prove a far greater annoyance and devourer of Grain to all the rest of the neighborhood. It is an unknown quantity of Wheat, Barley, Pease, &c. that these devour; not to mention the Prodigious computation that some Pigeons have made of the damage committed by them on the Corn, Grain, &c. yet it is most evident, that they destroy a great part of the Seed and Crop, notwithstanding several stand for their vindication, alledging that they never scrape, and therefore take only the Grain that lies on the Surface of the Earth, that would otherwise be destroyed, and not grow. To which I answer, That that very Corn that lies on the Surface, may prove the best Corn, unless (in Winter-Corn) where the extream Frosts destroy it, or (in the Spring) the extream Drought: It having been of late found to be a piece of very good Husbandry in some light and shallow Lands, first to Plough it about *August*, and then to run the Fold over it, and well settle it, and afterwards to Sow and Harrow it; which must needs make well for the Pigeons, and ill for the Husbandman, where they cannot be kept from it.

And it is to be observed, that where the flight of Pigeons fall, there they fill themselves and away, and return again where they first rose; and so proceed over a whole piece of Ground, if they like it. Although you cannot observe any Grain above the Ground, they know how to find it: as I have seen the experience of it, that a piece of about two or three Acres being sown with Pease, the Pigeons lay so much upon it, that they devoured at least three parts in four of it; which I am sure could not be all above the Surface of the ground. That their Smelling is their principal Director; I have also observed, having sown a small Plat of Pease in my Garden, (near a Pigeon-house) and very well covered them, that not a Pease appeared above-ground. In a few days a parcel of Pigeons were hard at work in discovering this hidden Treasure; and in a few days, of about two quarts, I had not above two or three Pease left; for what they could not finde before, they found when the Buds appeared, notwithstanding they were howed in, and well covered; their Smelling only directed them, as I supposed, because they followed the Ranges exactly.

The injury they do at Harvest on the Pease, Fitches, &c. I hope none can excuse: therefore may we esteem these amongst the great Enemies the poor Husbandman meets withal; and the greater, because he may not erect a Pigeon house, whereby to have a share of his own spoils, none but the Rich being permitted so great a priviledge; and also so severe a Law being made to protect these winged Thieves, that a man cannot *sum defendendo* encounter with them.

You have therefore no remedy against them, but to affright them away by noises, or such like. Also you may shoot at them, so that you kill them not; or you may (if you can) take them in a Net, cut off their Tails, and let them go, by which means you will impound them; for when they are in their Houses, they cannot bolt or fly out of the tops of their Houses, but by the strength of their Tails; which when they are weakened, they remain Prisoners at home.

Jays.

The *Jay* proves a great devourer of Beans, Cherries, and other Garden-Fruits, and is a subtle Bird; but is easily met withal, if you are watchful in a morning early, and have a good Ambush, which you must change sometimes, lest they discover you: They make short flights, as it were from Tree to Tree, that you may easily pursue them.

A very good way to take them, is to drive a Stake into the Ground, about four Foot high above the Surface of the Earth: let the Stake be made picked at the top, that a *Jay* may not settle on it; then within a Foot or thereabouts of the top, let there be a hole bored through, about three quarters of an Inch Diameter; fit a Pin or Stick to the hole, about six or eight Inches long; then make a Loop or Spring of Horse-hair fastened to a Stick or Wand of Hazel, that may be entered into the Stake at a hole near the ground, and by the bending of the Stick put the Loop of Horse-hair through the upper hole, and put the short Stick, that the *Jay*, when he comes, finding his resting place to stand conveniently amongst his Food, perches on the short Stick; which immediately by his weight falls, and gives the Spring the advantage of holding the *Jay* by the Legs. This is an undoubted way of taking them, if they are placed amongst the Beans, or such-like where the *Jays* haunt, it being their usual custom to hop from Tree to Tree, or any thing they can meet withal.

Bulfinches.

Bulfinches are most pernicious Birds to young Fruit-Trees, by feeding on the young pregnant Buds in the Spring-time, which contain the Blossoms, and are the only hope of the succeeding year.

If *January* prove very cold that the *Black-thorns* are backward in *February*, then will the *Bulfinches* be very busie in the Gardens. The Trees there growing being the forwarder than in the Fields. I have known such a cold Winter drive so many of these Birds into the Gardens that in a little time they have almost totally unbudded the Plum-trees, Currant-trees, &c. of a whole Town.

They are easily taken off with a small Fowling-piece, only you must be cautious that your shot spoil not the young Clons or Branches of your Trees.

This Bird is so bold, or rather confident, that no Scare-crow, or other thing, will frighten him from the Trees he delights to feed on: but on the *Morocco-Plum*, or the *Damson*, notwithstanding all you can do, he will settle and feed: So that your best way to preserve those Buds, is to Bird-lime the Twigs.

Goldfinches.

Gold-Finches are very injurious to the Goosbury-Buds, coming in Flights, and cleansing a whole Garden of them immediately; as the *Bull-Finch* will the Buds of the Currant-Tree. The remedies against them are the same with the other.

The *Chaffinch*, *Green-Finch*, *Titmouse*, and other small Birds, are injurious to some Fruits; but not like unto the other before-mentioned, who will prey on the Buds of all sorts of Fruit-Trees, under the very Nets that cover the Trees, and near unto the dead bodies that hang on the Trees, and kill'd but a little before.

Sparrows.

Sparrows, although they are but small, yet are they a numerous Generation of Corn-eaters: It is unknown how much they devour in this Kingdom, and what a great damage it proves to the Husbandman, especially in scarce and dear years.

Many ways are made use of to destroy them, but none more effectual than the large *Folding Sparrow-net*, which will take many dozen at a draught

draught, they being so easily induced to come to a *Shrape* or place baited for them; especially in the hard weather in the Winter, and in the Summer before the Corn is ready for them: at both which times Meat is scarce abroad; and then they flock to Barns.

More as to the destroying of Fowl, you shall find hereafter in the Chapter of Fowling and Fishing.

S E C T. V.

Of Insects, and creeping Things offending.

Mout and warm Lands, which are usually the most fertile, are most subject to these Vermine. *Frogs* are best destroyed and prevented in *February*, in the Ditches where they Spawn, by destroying both *Frogs* and *Spawn*. *Toads* are easily discovered in the Summer-Evenings (by a Candle) creeping up and down the Walks and Passages about your House, Garden, &c. Frogs and Toads.

To *Wall-Fruit*, and several sorts of *Garden-Plants*, there cannot be a more pernicious Enemy than *Snails*, which you may in a Dewy morning easily find where they most delight to feed; but the surest way is in the hard Winter to seek out their haunts, and make a clean riddance of them: They lie much in the holes of Walls, behind old Trees, under Thorn, or other old and close Hedges. In one year I caused near two Bushels to be gathered in a Winter in a Noble-mans Garden, which had in precedent years destroyed the most of their *Wall-Fruit*, and ever after they had great plenty of Fruit. Snails and Worms.

Ever observe, not to pluck off such Fruit the *Snails* have begun to feed on, but let it remain; for they will make an end of that before they begin on more.

The best way to take *Snails*, is to set Tile, Brick or Board, hollow against a Wall, Pale, or otherwise; so that the *Snails* may seek shelter under them: Then about *Michaelmas* the *Snails* secure themselves in such places for the whole Winter, unless you prevent them, by taking them in *December* and destroying them; which is an easie and sure way to rid your Garden of them.

Worms may be picked up clean by a Candle in a moist Evening: if any escape you, another Evening may serve to find them.

Your Beds watered with any strong *Lixivium* made of the *Asbes* or fixt Salts of any *Vegetable*, will not only destroy *Worms*, but prove an extraordinary improvement and enriching of the ground.

Lay *Asbes* or *Lime* about any Plant you desire to preserve from *Snails* or *Worms*, and they will not come near it, because the hot and biting nature thereof hurt their naked and tender bodies: therefore as the Rain or other Moisture weakens, the *Asbes* or *Lime* renew it, lest it prove useless.

Rarely do *Gnats* and *Flies* offend in the *Fields*, *Orchards*, or *Gardens*, yet are they very troublesome Guests in the House, where it stands near any *Fens*, *Waters*, or such like places, tending much to the Generation of *Insects*. Gnats and Flies.

To keep the Windows of your Chambers close in the Summer-time, especially towards the Evening, is a good prevention.

To burn Straw, and such-like, up and down in the Chamber, in the Evening before you go to Bed, will destroy them; for either they will

fly to the flame and be consumed, or else the Smoke will choke them. *Aspen-leaves* hanged up in the Room, will attract them unto it, that you will be the less troubled with them.

The Balls of Horse-dung laid in the Room will do the same, if they are new.

Wasps and Hornets.

Wasps and *Hornets* usually prove very injurious to some sorts of Fruits, as to *Bees*, &c. and are several ways destroyed. First,

By way of prevention; that is, in the *Spring* or *Summer*, before they have increased, to destroy the old ones; for from a few do they increase to a multitude.

Or you may smoak or stifle them, if they are in any hollow Tree; or scall'd them, if in Thatch of an House or Barn, &c. or in the Ground you may either scall'd or burn them, or stamp it in the Earth on them, and bury them.

To destroy such as come to your *Fruit*, *Bees*, &c. set by them *Sider*, *Verjuice*, *lowre Drink* or *Grounds*, in a short-necked Vial open, wherein you may catch many.

Also you may lay for them *Sweet Apples*, *Pears*, *Beasts Liver*, or other *Flesh*, or any thing that they love, in several places; upon which you shall have sometimes as many as will cover the Bait, which you may kill at once.

Caterpillars.

We term those *Caterpillars* that destroy the Leaves of our Trees in the Summer, devour *Cabbages*, and other Garden Tillage, and are generally the effect of great Droughts.

To prevent their numerous increase on Trees, gather them off in the Winter, taking away the *Packets* which cleave about the Branches, and burning them.

In the Summer, whilst they are yet young, when either through the coldness of the night, or some humidity, they are assembled together on heaps, you may take them and destroy them.

Earwigs.

Earwigs in some years prove injurious to Fruits, by the greatness of their numbers feeding on and devouring them.

And are destroyed by placing *Hoofs* or *Horns* of Beasts amongst your Trees and Wall-fruit, into which they will resort. Early in the morning you must take them gently, but speedily off, and shake them into a Vessel of scalding Water.

Lice.

By reason of great Drought, many sorts of Trees and Plants are subject to *Lice*: and seeing that they are caused by Heat and Drought, as is evident in the *Sweet Bryar* and *Gooseberry*, that are only Lowlie in dry times, or in very hot and dry places: therefore frequent washing, by dashing water on them, may prove the best remedy.

Ants.

Ants or *Pismires* are injurious to a Garden, and also to Pasture-Lands, as well by feeding on Fruits, as by casting up of Hills, &c.

In the hotter Regions these Creatures are reckon'd amongst the Pests of the Field, as in *Italy*, *Spain*, and also in the *West-Indies*. Yet are they commended as the Emblem of Knowledge, or industrious Providence: for the *Egyptians* used the *Ant*, as the Hieroglyphick for Knowledge, every one of them laying up his own store for the Winter; never robbing their Fellows although they want themselves.

To keep them from your Trees, compass the Stem four fingers breadth, with a Circle or Rowl of Wooll newly plucked from a Sheeps Belly.

Or annoint the Stem with Tar.

Also

Also you may make Boxes of Cards or Pastboard pierced full of holes with a Bodkin, into which Boxes put the Powder of *Arsenick* mingled with a little *Honey*; hang these Boxes on the Tree, and they will certainly destroy them: make not the holes so large that a Bee may enter, lest it destroy them.

Also you may hang a Glass-bottle in the Tree with a little *Honey* in it, or moistned with any sweet Liquor, and it will attract the *Ants*, which you may stop and wash out with hot Water, then prepare it as before.

Watering often of Allies or green Walks, will drive away or destroy the *Ants* that annoy them.

Ant-hills prove a very great injury to Meadows, and Pasture-lands, not only by the wasting of so much Land as they cover, but by hindering the *Sythe*, and yielding a poor hungry Food, and pernicious to Cattle. To destroy Ant-Hills.

And may be thus easily destroyed: Pare the Turf off, beginning at the top, and cutting it down into four or five parts, and lay it open: then cut out the Core below the Surface, so deep, that when you lay down the Turfs in their places, as they were taken up, the place may be lower than the other Ground, to the end that Water may stand in it to prevent the *Ant* from returning, which otherwise she will assuredly do; then spread the Earth you take out thinly abroad. Also the proper season for this is in the Winter; and if the places be left open for a certain time, the Rain, and Frost upon it will help to destroy the remaining *Ants*: but be sure to cover them up time enough, that the Rains may settle the Turfs before the Spring.

The greatest injury these Vermin do us, is in biting Children, Cattle, Snakes and Adders.

They affect Milk above any thing; and, as old Authors say, abominate the *Asb*: there may you use the one by placing of it hot in any place where they frequent, to attract them, where you may destroy them and the other, by laying *Asben-sticks* in places where you would not have them come. But this of the *Asb* is not to be credited.

But the most proper remedy against these Vermin, is to keep *Peacocks* which prey upon them.

Their Sting or Bite is most easily cured, if you timely apply a hot Iron to it, holding it so near as you are able to abide it: And it is by some ingenious Persons confidently affirmed, that it will attract the Venom totally from the Wound. To cure the Stinging of Adders, or Biting of Snakes.

Travellers relate, that in the *Canaries* the Natives cure the biting of a very venomous Creature (that lurks amongst the Grapes, and usually bites them by the Fingers) by opening the place bitten with a sharp knife, by a straight Ligature below the Wound; and holding the Finger bitten upright, for some time, out of which the Venom ascends, it being of a fiery Nature, naturally tending upwards, and may therefore be attracted by Fire, it's like.

S E C T. VI.

Of some certain Diseases in Animals and Vegetables.

There are several Epidemical and destructive Diseases to Cattle, Fowl, of Beasts and Fowl. *&c.* which sweep away a great part of the Husbandmans Stock before it ceaseth, or, he know how to prevent it: which is esteemed a great deficiency

ciency, that those ways that some have discovered, and found effectual to prevent, and also to cure such Diseases, are not made publick: the general Stock of the Kingdom may as well be preserved, as some few Cattle, in such general Distempers; it being not our intent in this Book to say any thing of common Diseases of Beasts or Fowls, because that subject is so compleatly handled by several others, and is not absolutely necessary for our Husbandman to know, there being almost in every place Professors and Practisers of that Art, and that have Materials and Instruments for that purpose: yet for that I meet with some general and easily practicable Instructions, perhaps not familiar with *Country Farriers*, or *Horse-Doctors*, I shall a little digress.

Of the Murrain
vs. 10.

The *Murrain* is a Disease principally caused from a hot and dry season of the year, or rather from some general putrefaction of the Air, and begetteth an inflammation of the Blood, and causeth a swelling in the Throat, which in little time suffocateth the Cattle. Also the letting dead Cattle lye unburied; which Putrifying may cause a general Infection to that sort of Cattle, as the Learned *Van-Helmoun* observes, that these Infectious Distempers go no farther than their own kind.

Therefore to prevent this Disease, let them stand cool in Summer, and to have abundance of good Water, and speedily to bury all Carcasses.

And if any of your Cattle be already infected, speedily let them Blood, and give them a good Drench, &c. By which means divers have preserved their Cattle, when their Neighbors have perished.

The rot in
cattle.

By Feeding of Cattle in Meadows that have been long overflown in wet Summers, till the Grass hath putrified, or by feeding them with Hay made of such over-watered Grass, notwithstanding thrashing, or any other Artifice used about the same, Cattle have been so infected thereby, that multitudes have dyed; dry and sweet Fodder is the only prevention of those Diseases. And it is more advantageous to the Husbandman to make Dung of such Pastures and Hay, than give them to his Cattle.

Of the Rot
in Sheep.

In moist years Sheep are subject to the Rot in the same Grounds, where in drier years they are not, and that not only from the moisture, for then would sheep rot in all moist Grounds, in dry years as well as in wet; but from a certain Putrefaction both in the Air, and in the Grass or Herbs that usually attend them in such moist years; which together with their moist Food, do corrupt their Livers, and bring this Disease.

The cure whereof is difficult, unless it be done betime before the Liver be too much wasted: The removal of them to the *Salt Marshes*, where they may be had is a good remedy.

If *May* and *June* prove wet Months, it causes a Frimm and Frothy Grass; which together with the Bad Air that must necessarily follow, causes the Rot in Sheep: therefore in such Summers keep your Sheep on the dry and barren Lands, and fodder them in Winter with the hardest Hay or most Astringent Fodder.

Some Grounds yield a soft Grass, more than other, subject to breed the Rot in the Sheep: therefore feed other Cattle there, and your Sheep in the driest, hardest, and healthiest Pastures.

If your Sheep be infected with the Rot, which you may discern by the colour of their Eyes; some prescribe to Pen them up in a Barn, or large Sheep-coat, set about with wooden Troughs, and therein feed them with

with Oats a day or two : then put amongst them some Bay-Salt well stamp-
ed, and after that a greater quantiry, till such time as they begin to distaste
it ; then give them clean Oats another day or two, and afterward serve
them with Salt as before. This course being followed until their Eyes have
recovered their natural colour, they will then be perfectly cured. Where
you have not a house convenient, it may be done open : the saving of
their Dung (as before we directed) will answer the greatest part of your Chap. 51
expences.

Folding of Sheep in *May* or *June*, if they prove wet, makes them Rot
the sooner, because they more greedily devour the hurtfull Grasse in the
Morning, than those not folded ; therefore Liberty from the Fold at that
time is a good prevention.

*An approved Experiment for the cure of the Fashions in
Horses, and the Rot in Sheep.*

Steep the *Regulus of Antimony* in *Ale*, with a little of the Spice called
Grains, and a little Sugar ; which give to a Horse about half a Pint at a
time, two or three times, with a day or two's intermission between each
time ; to a Sheep about two or three Ounces after the same manner. The
same, or the following Receipt, may be also given to Swine for the *Measles*,
&c. and to make them fat.

Give him half a dram of crude *Antimony* in his Meat, it will make him For Swine
have a good stomach ; and it will likewise cure him of all foulness of his
Liver, and of the *Measles*. The same is also Sovereign for any other
Beasts.

Trees, and *Plants*, and other Inanimate things, are subject unto Disea- of Trees and
Plants.
ses that deprive them of, and abate their excellency, worth and durati-
on, as well as living Creatures ; and it doth as well require the Care
and Industry, and Skill of the Husbandman to inspect into their Nature,
and make use of such means as are requisite, as well to prevent, as cure
such Diseases.

The *Canker*, *Moss*, *Bark-bound*, and *Worms* in *Trees*, prove very per- Chap. 52
nicious : Their Cures we have already discoursed of.

The *Faundies*, or *Langor* of *Trees*, makes them seem to repine, and
their Leaves to fall off and wither, and proceeds from some hurt done to
their Roots, either by *Moles* or *Mice*, or by the Stroke of some Spade,
or by the Tree standing too moist or low : according as you find the Di-
sease, so must you make use of a Remedy, either by searching the Root ;
and if you find any Wound or Gall, to cut it off a little above such wound,
and lay some Soot there to keep Vermin off, if the injury came from them ;
or if Water offends, either divert the Water, or remove the Tree : if it be
Planted too deep, it is better to raise it, then let it stand where you may
be confident it will never thrive.

The general Diseases of *Trees*, and impediments to their thriving, are,
either they stand too deep, too dry, too cold, too moist, or too much in the
wind, &c. according to the divers Nature and disposition of the Tree.

Therefore if you expect that a Tree should thrive, observe his Nature,
and in what place it most delights ; which the sixth and seventh Chapters
of this Book, Treating of *Woods* and *Fruit-Trees*, will sufficiently di-
rect.

The Diseases of Fruit-Trees and their Cures are more fully and largely Treated of in my *Vinetum Britannicum*.

S E C T. VII.

Of Thieves and Ill-Neighbours.

Against
Thieves.

There is no more certain, constant, and pernicious Enemy to the Husbandman. Thrift, than Man himself; *Homo homini demon*: they rob and steal from, oppress, Maligne, injure, persecute, and devour one another, to the decay of *Arts*, and *Sciences*, and even to the ruine of whole Families of Ingenious and Industrious Men; every one striving to build up his House, and raise his Family by the ruines and decay of his Neighbors. But our only complaint is against the common and ordinary sort of vile persons, that live after a most sordid manner, and seek not Wealth nor Greatness, but only to maintain themselves in a most despicable, lazy kind of life, by filching and stealing from their honest and laborious Neighbours; and against such, that though they steal not, yet oppress, oppugne, and injure those that are more industrious than themselves.

The severe penalty of Death being the punishment for Theft, is the principal cause of the infinite increase of Thieves: First, because many there are, who (if they know or have taken a Thief) will not Indict nor Prosecute him, because their Conscience will not admit of inflicting so severe a Punishment for so small an offence, but will rather bear the loss of their Goods, than seek another mans life for it.

Secondly, Some, if they take a Thief, will rather accept of their Goods again, and satisfaction, than prosecute him; because in some cases they loose their Goods, and are also at the charge of Prosecution.

Thirdly, Some will not prosecute common ordinary Thieves that live by stealing *Sheep*, *Corn*, *Wood*, *Poultry*, *Swine*, &c. and have Families to maintain by this very Trade, lest they (being part of the Parish) be bound afterwards to maintain their Families. And thus are the conditions of many places in *England*.

Fourthly, When Thieves are taken and prosecuted, and come to their Tryal; they being for their Lives, no Evidence will, nor ought to be taken, but what is very clear: And where it is so against one, either through mistakes, or wilfull omissions, it is deficient against five; by which means most of those few that come to Tryal are found *Not Guilty*.

Fifthly, When they are upon Tryal, and the Evidence clear against them, either the Jury are tender of their Neighbours life, or else some good Friend or other appears, that it is found but *Petit Larceny*; or else the Thief has his Clergy, or by some such Shift, or Means, or Evasion, he gets off: So that it may be, as it often happens, a Thief comes five or six times to his Tryal, or at least to Goal, before he is hanged: During which time he grows more subtle, and Educates many other in the same Profession, and teacheth them all manner of Tricks and Devices, not only to effect their intentions, but to avoid the Punishment.

To remedy which, were to make the penalty more moderate, and without Respect or Favour to be assuredly executed; it would much lessen their number.

As suppose the Penalty of all manner of Theft, were to be transported to the *West-Indies*, or to be confined to some certain Mines, or such-like, at the pleasure of the Judge; and to have an apparent Brand or Mark in the Face; and that it should be free and lawfull for any man to kill any such person returning or straying from such imployment; and that every one that lost their Goods, and did prosecute the Thief, should have their Damages and Costs restored: I suppose none would make any scruple of Prosecution, nor would any endeavour to preserve these Vipers from so moderate, yet sufficient punishment.

This way, if severely prosecuted, without Favour or Respect, would in a little time rid the Country of the old Thieves, and their very breed also, that there would scarce be any of their Blood remaining: But if any should by chance appear, he would hardly have any time to learn his Trade perfectly.

But until some such Law be established, which we humbly leave unto our *Grand Patriots* to consider of, on whom we Rusticks depend, for good and wholesome Laws to preserve our Interests; which will the better capacitate us to serve His Majesty, and answer his Occasions with our Fortunes, as well as with our Lives: and will also the better enable us to pay our Rents unto them, and improve their and the whole Kingdoms Revenues.

In the mean time (I say) let us endeavour the preservation of our Goods from these Vermine and Children of Darknes, by such means, and by what Industry we are capable of, as by diligent and carefull watching; *Quæ enim res quotidie videntur, minus metuunt furem*; by making good and secure Fences, and by having our Doors, Walls, and Windows of our Houses, Barns, Stables, Gardens, &c.

We shall not here contend with any, whether the Rules of *Astrology* to discover Theft, the making or laying of *Charms*, *Spells*, or *Sigils* to prevent Theft, or the Art of inforcing the Thieves to bring back Goods stolen, be lawfull or not: *Quæ supra nos, nihil ad nos*.

But if I know the certain or probable haunt or way the Thief useth, I may safely make use of some Gin or Snare to keep him by the Legs, or otherwise till I come and release him; or I may place certain sharp Spikes of Iron in the Ground, and strain some pieces of small Brass-Wire athwart the way near the ground, on either side of the sharp Spikes, (which Wire and Spikes are not visible by night) that when Mr. Thief walks and thinks not of it, by stumbling at the Wire, he falls on the Spikes; which give him such marks, that you may perhaps know him against another day.

Or you may run Wires across your Backside, the ends whereof may be fastened to some Lock of a Pistol, or such like, that by the touch only of the Wire the Pistol may be discharged, which will give you notice, and also terrify the Thief; and may be so placed, that it may shoot directly towards him.

Or you may have a Bell to Ring, only by the touch of such a Wire, which may terrify the Thief, and give you notice.

A good *Mastiff* is a singular Preservative to a Back-side against such that are not of his acquaintance, or that know not how to charm him; which few Country-Thieves understand: but if he be kept within doors, he is a sure Defence against Burglary, and out of the

Ill Neigh-
bours.

Charmers power. The small bawling Curs are the surest Watchers, and are good to rouse up the Mastiffs.

An ill Neighbour is a very great Evil, and a good Neighbour as great a Happiness, said old *Hesiod*.

What a grief, loss, and inconvenience it is to be confined to dwell by ill Neighbours? how it multiplies our Cares, and increases our Labours, & lessens our Stocks and Profits? How are we disquieted at the sight of them? and how are our Fruits destroyed, and our Corn spoiled by them and their Cattle, who are continual Trespassers? especially if they think we are so peaceably given as to put up small injuries, or that we are unwilling to seek remedies worse than the disease against these Enemies to our good Husbandry, and to our otherwise most happy life. We have no remedy but Patience, the best of Virtues.

Yet some policy may be used to charm these Crocodils, to make these Furies Friends: please a little their Natures, and feed their Humours in what they delight; by being their seeming friends you may commend them, and they will be as ready to serve you, as to prosecute another neighbour that less deserves, only because he uses not the same Method of policy. If they love their Bellies, invite them often; *Empotissimum vocato, quicunque te prope habitat*; be sure to please them that are most capable of doing you hurt: whatever they delight in, please them in it, and you have done enough, for you know not what need you may have of a neighbours help; sometimes may Thieves assault you, sometimes you may want some particular Instrument that your Neighbour hath, without which, or whilst you go farther, you suffer great loss; and what a sad thing it would be to be denied, as *Hesiod* in his time observed.

Streighten not your self so, as to ask to borrow of another, lest he refuse and you want.

CHAP.

CHAP. XI.

Of the several sorts of Instruments, Tools and Engines incident to this Profession of Agriculture; and of some Amendments and profitable Experiments in Building, either by Timber, Stone, Brick, or any other way.

*Dicendum, & quæ sint duris Agrestibus Arma;
Quæ sine nec potuerunt feri, nec surgere Messes.*

Virgil.

The hardy Plowmans Tools we next must know,
Which wanting, we can neither Reap nor Sow.

IT is impossible to go through the many difficulties in this Art, without many and several sorts of Tools and Instruments, as Ploughs, Carts, &c. It is also difficult and unprofitable to make use of such Ploughs, Tools, & Instruments that are troublesome, heavy and chargeable, when the same labour may be as well performed, if not better, with such that are easy, light, and not so costly: Therefore I shall in this Chapter discover unto you all the several sorts of Instruments necessary for the Husbandman, and what inconveniencies have been found in some of them; and the Remedies, and what new ways or Methods have been of late discovered to facilitate his Labours, as I find them dispersed in several Authors, and have observed the same in several parts of this Kingdom; this Instrumental part of *Agriculture* being not of the least concernment: And shall also discover unto you several profitable Experiments and Directions in Building, necessary to be known.

SECT. I.

Of the several sorts of Ploughs.

And First I shall begin with the Plough, the most necessary Instrument, the chiefest of all Engines (as *Gabriel Plat* terms it) and happily found out.

There is a very great difference in Ploughs, that there is scarce any sure Rule for the making of them; and every Country, yea almost every County differs, not only in the Ploughs, but even in every part of them.

Ploughs also do not only differ according to the several Customs of several Places, but also the Lands do differ in strength or weakness, or the different Nature of the Soil.

To describe them all, is not a work for this place; but I will give some brief Descriptions of the principal sorts of Ploughs of the greatest esteem: And first of the Double-wheeled Plough, which is of most constant use in *Hartfordshire*, and many other Countries, and is very usefull upon all Flinty, Stony, or hard Gravel, or any other hard Land whatsoever: It's esteemed a usefull and necessary Plough. These require a greater strength
F f 2 then

than other Ploughs, and to be used in such places where other Ploughs will not to any purpose. It is usually drawn with Horses or Oxen two abreast: the Wheels are usually eighteen or twenty Inches high; in some places the Furrow-wheel is of a larger circumference than the other that goes on the solid Land.

*Turnwrest
Plough.*

There is another sort of Double-wheeled Ploughs, called the *Turnwrest Plough*, which surpasseth for weight and Clumlinefs, and is called the *Kentish Plough*, being there much used.

*Single Wheel-
Plough.*

The *One Wheel-Plough* is an excellent good one, and you may use it on almost any sort of Lands, and is of that shape and form that will admit of more lightness and nimbleness than the other *Wheel-Ploughs*; being the same that Mr. *Hartlib* speaks of to be made near *Greenwich*, by one who had excellent Corn on barren Land, and yet Ploughed his Land with one Horse.

*English Im-
prover.*

This Plough neatly made, and very small, hath been drawn with one Horse, and held by one Man, and ploughed one Acre a day at Sowing-time, in a moist Season: There hath been with six Horses, six Men, and six Ploughs, ploughed six Acres a day at Sowing-time, in light and well-wrought Land. This seems to accord with the Plough used in *Hesiod's* time, where the Plough-man did both guide and drive.

Plain-Plough.

There is a sort of Plough made without either Wheel or Foot, described at large by Mr. *Blith*, to be the most easie going-Plough, and of least Workmanship, Burden or Charge, called the *Plain-Plough*, fit for any Lands, unless in irregular extream Land, either for Stones, Roots, or Hardness; and there adviseth to the *Double-wheeled Plough*, being of strength to supply extremities and cases of necessity.

*Double
Plough.*

*English Im-
prover.*

Mr. *Blith* describes a double Plough, the one affixed to the side of the other, that by the help of four Horses and two Men you may Plough a double portion of Land, the one Furrow by the side of the other. This he esteemeth not to be of any great advantage above the other plain Plough, yet may be of good use on some Lands.

*Another sort
of Double-
Plough.*

There is another sort of *Double-Plough* much exceeding the other, as Mr. *Hartlib* in his Legacy testifies of an ingenious young Man of *Kent*, who had two Ploughs fastened together very finely, by the which he Ploughed two Furrows at once, one under another; and so stirred up the Land twelve or fourteen Inches deep.

This is one of the best additions to the Plough, if thoroughly prosecuted; for most Land requires a deeper stirring than is ordinarily given it by the usual way of Ploughing, as is evident by those experiments that have been made in digging and setting of Corn. This way also comes near that of Digging, and in some cases excels it, because it only looseneth and lighteneth the Land to that depth, but doth not bury the upper-crust of the ground so deep as usually is done by digging. It is also much easier to Plough deep with this Double-Plough, than with the single; because it beareth not so great a burden, but the one part thereof is discharged before the other is taken up.

*Other sorts of
Ploughs.*

Some have made a Plough with a Harrow affixed thereto; others have designed a Plough, to Plough, Sow and Harrow all at the same time: But seeing they are of no great advantage to the Husbandman, only invented to satisfy the minds of some Scrutinists, I leave them.

Of all which several sorts of Ploughs, there is a great variation in the several parts of them; some differ in length and shape of the Beam, some in the

the Snare, others in the Coulter, and in the Handles. The Differences are so many, that no one Ploughman knoweth them all.

The Abuses, Faults and Errors incident to the Plough, are many; some in the Workmen and Drivers, who when they are wedded to an old erroneous Custom, though never so evidently discovered, will not recede from it; or in the Plough itself, as when it is made too big and cumbersome, and disproportioned, the one part too large or too little for the other; and when it is rough, and ill compassed in the Share; when the Handles are too short or too upright, the Irons dull: And many other faults there are which greatly hinder the Husbandmans ease and advantage, and which ought to be remedied. And if you will have your Plough do you service, and gain you advantage, it ought to have these several good properties, or as many of them as you can obtain.

It ought to be well-proportioned for strength, according to the nature or strength of the ground you are to Plough; that the Irons be sharpened, and wear bright. Also the shorter and lesser any Plough is made, having its true Pitch, with its true cast on the *Shield-board*, and *short Wrest*, and *sharp Irons*, the far easier.

What else is necessarily requisite in the Plough, you may better find by your Manual and Ocular Experience, than by all the instructions that can be here given, (as in *Plautus*) *Pluris est oculus testis unus, quam auris decem*. Yet if you are desirous to read the large Descriptions of the several sorts of Ploughs now in use, with all their diversities of *Coulters*, *Shares*, *Shield-boards*, *Wrests*, &c. I refer you to the *English Im-prover*.

There may be other Ploughs made for several uses not usually known; as lightly to pare off the Turf of soarded-Land, as they usually do that most laborious way with the *Breast-Plough*, to be burnt on heaps after it is turned and dried: This would save the greatest part of the Expence of Burn-beating, and be every whit as well, if not better.

I have heard of Ploughs drawn by Mastiff Dogs; others promise much of Ploughs driven by the Wind: but these I esteem as fruitless to the Husbandman, and rather the Products of Superficial Ingenuity.

Concerning Ploughs or Instruments for the making of the Furrow, Sowing the Corn, and covering of it with the same Plough; with the several other uses of that and other Ploughs, you will find discovered in their proper places.

SECT. II.

Of Carts and Waggon.

There are several sorts of *Waggon*s, *Carts*, &c. some with four, some with two Wheels; and also for several uses, either for the carrying of Timber, Corn, Dung, or such like; all differing the one from the other, according to the several places, whether Hilly, Level, Stony, or Clay, or to the several occasions for which they are intended. In some places they are much more curious in the forming of them, making

Contrary to
the opinion
of some.

making them neater, lighter and slenderer, as well in the Wheels, as in the other parts of the Cart or Waggon. The Wheels, the more upright or square the Spokes are from the Box or Center, the weaker they are when they come to bear on either side: to that end they make them concave or dishing, and also to secure the Wheel from breaking in a fall. The greater the circumference of the Wheel is, the easier is the motion, because the Ring or Bond of the Wheel is the more flat, and doth more easily over-pass any stones, or other obstructions in the way, and sinks not so easily into the Concavities or defective places of the Earth: Its motion is also slower at the Center; for the greater Wheel of eighteen feet in the circumference goeth but once round in the same measure of ground where the lesser Wheel of nine feet in the circumference goeth twice; and so according to the same Rule and proportion, where the difference is greater or lesser: therefore the lesser the Wheels are of any Cart, Waggon or Plough, the heavier it goes, and more unevenly or jogging. The reason why the Fore-wheels are lesser in a Waggon, is only for its conveniency in turning.

New sort of
Carts.

The higher a Cart or Waggon is set, the more apt it is for overturning: but because the setting of it low, and the height of the Wheels, after the usual way of placing them, cannot consist together; therefore it may prove very commodious to place the Bed of the Cart under the Axle-tree, at such distance as the depth or shallowness of the ways or waters you are to go through will bear; for by this means part of the weight will be under the Axle-tree, which will so far counterpoise what is above, that it will very much prevent the overturning or oversetting the Cart or Waggon: For we evidently see, that the higher a Load lieth, whether it be Hay, Corn, Straw, &c. the easier it oversets; and the lower it lies, as Stones, Metals, &c. the more rarely; if you make the Tail of the Cart or Waggon turning upwards, I cannot perceive any inconvenience can arise from this way.

They are much more curious in making of them in some places, than in other; as in *Holland* they make them very neat, and light; one Horse shall effect as much with a slender, neat, and light Cart and Wheels, as two shall with a cumbersome heavy one.

Waggon with
Sails.

Hartlib's
Legacy.

In *China*, Waggon are made to pass frequently with Sails, like Ships, (as Historiographers relate.) It's probable their Winds are more certain and constant, and their ways more level than they are here. In *Holland* a Waggon was lately framed, which with ordinary Sails carried thirty people sixty English miles in four hours: I have seen much done of this nature, and more might be done, as to make a Cart or Waggon move against the Wind; and the more the Wind blows, the faster it shall move against it, by the help of the Perpetual Skrew, &c. But these being not to our present purpose of advantage, I shall leave to others.

S E C T. III.

Of several other Instruments used in Digging, &c.

Of the
Trenching-
Plough.

The Trenching-Plough or Coulter is a certain Instrument used in Meadow or Pasture-ground, to cut out the sides of Trenches, Carriages or Drains; or it is used in cutting out the sides of Turf for the taking of it up whole, to the intent to lay it down again in the same or some other place: It is only a long stale or handle, with a Button at the end for ones hand

hand, and at the other end it turns upwards, like the Foot of a Plough, to slide on the Ground; in which Bend must be placed a Coulter or Knife of that length you intend the Turf to be in depth.

Several fashions there are of them, some with one Wheel, some with two, some with none; you may make them as you please.

There are many sorts of Spades, according to the diversities of places, of Spades. and the several occasions and humours of Men.

One sort is made very thin, light and sharp, with a Socket to put the Stail in, like the Hedging-Bill; the Bit very short, and not very broad; in shape much like a Spade in Cards; of very great use to some, though hardly known to others, to under-cut the Turf after it is marked out with a Fenching-Plough, which it doth with much ease and expedition.

For the cutting of Trenches in Watry, Clayie, or Morish Lands, they usually use a Spade, with a *Zanger* or *Fin* like a knife, bored up by the side of the Spade, and sometimes on both sides, to divide the Clay or moist Earth, and cut the small Roots that it come clean away.

The ordinary Spade is made several ways; but the most commendable are the lightest & thinnest wrought, not wanting their due strength: the cleaner they are kept, the better they work.

The *How* is an Instrument of very great use, and it is great pity it's no more used. If the spare times of the year (except when the Earth is frozen) were but made use of to How the several Creeks, Corners, and Patches of your Land, it would undoubtedly prove a very great improvement. More hereof in their proper places.

Besides the *spade* and *How*, and their kinds, there are several other Instruments used by the Husbandman for the grubbing and raising of Trees both great and small, and Bushes, Brakes, &c. and for the making holes and passages in hard and stony Lands for several occasions, and for the Loading and spreading of Dung, Earth, &c.

As *Mattocks*, *Pick-axes*, *Grubbing-axes*; and also the great Instrument described by Mr *Platt*, for the quick riddance of Shrubs, Broom, and such like, mentioned before, Chap. 10. The *Iron-crow* or *Iron-bar*, are not to be wanting: Also *Shovels*, the *Dung-fork*, *Mole-spades*, or *Paddle-staffs*, you will sometimes have occasion for.

SECT. IV.

Other various Instruments.

He that goes a borrowing, goes a sorrowing, is an old and true Proverb: Therefore it behoves our Husbandman that intends to thrive, to possess or furnish himself with all things necessary, and of present necessity for his Occupation, that he may not put himself to the trouble of borrowing, nor the damage he is likely to sustain for want of, nor the scorn or disgrace of being denied any thing he wants.

That you may not be forgetful of any, or at least of the most usefull and necessary Instruments, besides the fore-mentioned, I will enumerate such as come into my mind, and advise you to add what you find deficient, and let them all be placed in their proper places; according to *Xenophon's* Advice: *Supplex & Instrumenta varia Rustici, suo quaque loco & ordine disposita, in promptu sint, quoties vel promenda, vel requisita seponenda sunt.*

Belonging

*Belonging to the Arable and
Field-land, are*

Harrows.
Drags.
Forks.
Sickles.
Reap-hooks.
Weed-hooks.
Pitch-forks.
Rakes.
Plough-staff and Bettle.
Sleds.
Roller.
Mold-spears and Traps.
Cradle-sythes.
Seed-lip.

To the Barn and Stable.

Flails.
Ladders.
Winnowing-Fan.
Measures for Corn.
Sieves and Rudders.
Brooms.
Sacks.
Skeps or Scuttles.
Bins.
Pails.
Curry-Combs.
Main-Combs.
Whips.
Goads.
Harneys for Horses, and
Yokes for Oxen.
Pannels.
Wanteys.
Pack-ladders.
Suffingles.

Cart-lines.
Skrein for Corn.

To Meadows and Pastures.

Sythes.
Rakes.
Pitchforks and Prongs.
Fetters and Clogs, and Shackles.
Cutting-Spade for Hay-reeks.
Horse-locks.

Other necessary Instruments.

Hand-barrows.
Wheel-barrows.
Dibbles.
Hammer and Nails.
Pincers.
Sifters.
Bridle and Saddle.
Nail-piercers or Gimlets.
Hedging-hooks and Bills.
Garden-sheers.
A Grindstone.
Whetstones.
Hatchets and Axes.
Sawes.
Beetle and Wedges.
Leavers.
Shears for Sheep.
Trowels for House and Garden.
Hod and Tray.
Hog-yokes and Rings.
Marks for Beasts and Utensils.
Scales and Weights.
**An Aul, and every other thing
necessary.**

SECT. V.

Of Amendments and profitable Experiments in Building.

**As the Manners and Customs of Men are in every Age refined, and
tend more and more to Purity and Perfection in these Northern, and for-
merly rude and salvage Countrys, or rather grow more exact, and
imitate the other more Southerly, and first civilized parts in Lan-
guage, Manners, Arts, and Sciences; so do they also endeavour to Reform
their**

their most gross, undigested, and ill contrived Structures and Edifices, not only in Cities and Towns, but in their Country Villages also, that we now compare some of our Cities and Towns with most of theirs, and even excel them in several; and that not a few of our most suavious and delectable Rural Seats, as well for their Magnificent, Regular, and Artificial Structures, and most Ingenious contrivances, as in their most salubrious, convenient, and pleasant Situations.

And for the future, were but the Rules of Architecture duly observed, and those new and compleat Methods and Models contrived for Building, and the Situations of places, according to the best judgments taken notice of in such Buildings that may hereafter be raised, either *de Novo*, or in the restoring or reedifying of our ancient and decayed Seats in our Country-Villages, our England in a few Ages would appear a Kingdom beset and adorned in every part with curious and admirable Habitations, possesed with noble and ingenious Inhabitants; and would at large represent to the view of all, what *Middlesex* it's *Epitome* now doth; and would contract the Envy of other Nations, as the Land of *Canaan* formerly did.

Therefore let me advise all such that are willing or necessitated to Build, that they sit down and consider of the Manner and Method of Building, as well as of the Charge and Expence; and that they will make choice of such Surveyors and Workmen that understand what they go about, and not be guided or persuaded by such that are Wedded to an old deformed Custom, who will in no wise consent to a more compleat way, although it be much more Beautiful and Regular, and also with less Materials, and cheaper, and more convenient than the other, for no other reason but that it is a Novel, and not as our Forefathers did before us, yet perhaps are willing to bestow expence enough upon it in enriching it, although but with little Skill or Art. But I suppose it is better to erect that which will be pleasing to, and content both Wise-men and Fools, than that, though done by the same Cost and Expence, which will only please Fools.

This is a digression from our intended design, and here inserted only to perswade such that intend any store of Building, to make use of such Authors and Persons that understand that Art, which in this place we do not undertake to teach, only shall give the Husbandman a few general Rules and Directions that I have casually met withall, about the Situation and Building of a plain Country Seat, and the building of Walls, Barns, Mills, &c.

Pradium Rusticum bonum Caelum habeat, &c.

Let your Country-house have a good Air, and not open to Tempests, seated in a good Soil; let it therein excell, if you can; let it stand under a Hill, and behold the South, in a healthy place; let there be no want of Workmen or Labourers; let there be good Water, and let it stand near some City or Market-Town, or the Sea, or some Navigable River, or have a good Road or way from it. Thus Cato advises.

Little more can be said, but that Woods also as well as water may be near it, they being the principal things that adorn a Country Habitation: But if you cannot conveniently seat your House amongst the Trees, yet are there few places but you may raise speedily Trees about your House,

Chap. 6.

as before we directed, it being far better to have your House defended by Trees than Hills; for these yield a cooling, refreshing, sweet and healthy Air and Shade, during the heat of Summer, and very much break the cold winds and Tempest from every Coast in the Winter. The other according as they are situated, defend only from some certain Winds; and if they are on the *North*-side of your House, as they defend you from that Air in the Winter, so do they deprive you of it in the Summer; if they are on the *South*-side, it otherwise proves as inconvenient. Besides, they yield not the pleasures and contentments, nor the varieties of Oblectations to the ingenious Rustick, as the tall plumps of Trees, and pleasant Groves do; yet are Hills cloathed with Coppices, or otherwise improved, pleasant objects, so that they stand not too near your House.

*If On thy Native Soil thou dost prepare
To erect a Villa, you must place it there,
Where a free Prospect does it self extend
Into a Garden; where the Sun may lend
His Influence from the East; his radiant heat
Should on your House through various Windows beat.
But on that side which chiefly open lyes
To the North-wind, whence Storms and Showers arise,
There Plant a Wood; for without that defence,
Nothing resists the Northern Violence.*

Rapinus.

Let not your House be too low seated, lest you lose the conveniency of Cellars: But if you cannot but build on low grounds, set the lower Floor of your House the higher, to supply the want in your Cellar of what you cannot sink in the ground; for in such low and moist grounds, it conduceth much to the driness and healthiness of the Air, to have Cellars under the House, so that the Floors be good, and Cieled underneath.

It is very inconvenient to Build Barns, Stables, or such like places too near to your House, because Cattle, Poultry, and such like, require to be kept near them, which would then annoy your House. Let your Garden joyn to one, if not more sides of your House; for what can be more pleasant for the most part of the year, than to look out at the Windows of your Parler and Chambers into a Garden? What sides of your House are not joyning to your Garden, let there be Courts or Yards kept from Cattle, Poultry, &c. and Planted with Trees, to shade, defend and refresh your House; and the Walls also Planted with Vines, and other Fruits.

*Summe and
elementary
of Building a
House.*

Not to speak of the building of Palaces or Seats for the *Nobility* or *Gentry*, but only of plain and ordinary Farm-houses, I have thus much observed, that Houses built too high in places obvious to the Winds and not well defended by Hills or Trees, require more materials to build them, and more also of reparations to maintain them, and are not so commodious to the Inhabitants, as the lower-built Houses, which may be made at a much easier rate, and also as compleat and beautifull as the other. In building of a House long, you loose the use of some Rooms, and it takes up more for Entries and Passages, and requires more Doors: and if it be four-square, there must needs be light wanting in some part there-

of

or, more than if it be built like an H, or some other such like Figure ; which maketh it stand better and firmer against the Winds, and Light and Air come every way to it ; every Room is near the one to the other. The Offices, as the Kitchen, Dairy-rooms, Brewing and Baking-rooms, are near unto the Hall, which only divides between those and the Parlers, &c. Several Descriptions and Draughts of Foundations could I give you here, were not the cutting of them too costly for so Rustick a work to bear. The Walls, where Brick may be had, are best and most securely raised with it, and with little Cost, if you raise firm and strong Columns at the corners of your House, of strength sufficient to support the Roof or main Beams : you may Build them square, and between them may you raise the Walls with the same Materials, and Work them up together with the *Corners* or *Columns*, leaving the one half of the extraordinary breadth of the *Column* without, and the other within the Wall ; whereby you will save much Cost and Charges both in Materials and Workmanship, and yet your house firm and strong.

The heavier any Covering is to a House, the greater is the expence in raising the whole Frame or Building to support it, and the sooner doth it require reparations ; therefore healing with Lead or flat Stone is not to be approved of, by reason of its weight, where Earthen Tile, Slate, or Shingle may be had : Next unto Lead or Stone, Tiles made of Clay are the heaviest, and most in use.

Pan-tiles, such as come from *Holland*, are the best and lightest covering of any sort of Tiles ; and it is to be admired at, that another Nation can transport so Earthy a Commodity, and pay all Duties, &c. and sell them at our own doors at a cheaper rate than we can make them ; and yet have we as good Materials, and Fuel more plentiful than they.

A Composition of Clay, Sand, &c. is easily made for Tiles, that shall make them not only thinner and lighter, but also stronger and more durable, if ingenious men would undertake it ; which are rare to be found in so dirty, yet necessary an Occupation ; which would save very much charge and materials in Building, if it were truly prosecuted.

The same may be said of Bricks, &c. and with such a Composition may be made in Molds all Window-frames for a House of different work and magnitudes, and Chimney-pieces, and frames for doors, &c. in several pieces made in Molds, that when they are burnt may be set together with a fine red Cement, and seem to be as one entire piece ; whereby may be imitated all Stone-work now used in Building, and it will very well supply its defect where Stones are scarce and dear ; and also may save very much Timber which is now used in Brick-building, and appear much more compleat and beautiful, and be of more strength and of longer continuance than Timber or ordinary Brick, and is very feasible ; as we perceive by the Earthen-pipes made fine, thin, and durable, to carry water under the ground at *Portsmouth* ; and by the Earthen-backs and Grates for Chimneys, made by Sir *John Winter* formerly at *Charing Cross*, of a great bigness and thickness ; which are evident and sufficient demonstrations of the possibility of making work fine, thin, and light, for Tiles either plain or crooked, and for the making of great work in Molds, and the through Burning of them for Doors, Windows, and Chimney-frames, &c.

This is one of the most feasible and beneficial Operations that I know in *England* to be neglected.

Of Shingles.

Where either Tiles are scarce, or Timber not very plenty; that you would have your House but lightly covered, *Shingles* are to be preferred before *Thatch*; and if they are made of good Oak, and slit or clef out, and then well seasoned in the Water and Sun, they become a sure, light, and durable covering.

Slate.

Where it may be had, the thin blew Slate seems to be the best covering, being very light, and lasting.

Thatch.

This is a common covering in most parts, yet is some to be preferred before others; the best that I have seen is that which is called *Helm*, that is, long and stiff Wheat-straw (with the Ears cut off) bound up in bundles unbruised, which well laid lies thin, lasts long, and is much neater than the common way.

Of Building of Stone or Brick-walls.

It is an usual thing to see thick and tall Walls to fall, either by reason of the weakness of the Foundation, the weight of the Wall, or the decay of the Cement or Mortar through Age; which hath provoked several to great and unnecessary expences in laying deeper and stronger Foundations, and in making the Walls much thicker than usual; when all that extraordinary cost might be saved, by taking notice of these few Observations.

First, that streight walls, though thick, and seemingly strong, yet either by the falleness of the ground, or being obvious to high winds, or the decay of the Mortar, are apt to lean or fall.

Secondly, that walls built crooked, though thin and weak, are yet more lasting than a streight Wall.

Thirdly, that a Wall built over a River on Pillars or Arches, stands as firm as the rest of the Wall, whose foundation is entire; as I have in several places observed.

Which plainly demonstrates unto us, that a Wall built up much thinner than usual, having at every twenty foot distance (or such like, as you think fit) an Angle set out about two foot or more, according as the Wall is in height, or having at such distance a Column or Pillar erected with the wall six or eight inches or more on each side over and above the thickness of the rest of the Wall, the Foundation of such jetting out or Column being firmly laid, it must of necessity strengthen the Wall much more than if five times the Materials used in these Jettings or Columns were used in the wall being streight; which most evidently saves you a great part of your expence, and your wall much more firm and compleat: for if it be a Wall for Fruit-trees, those Nooks or Corners in the Jettings out, whether *Angular* or *Semi-circular*, are secure places for the more tender Trees; or if they are Columns or Pillars, they make the wall much the warmer, by breaking the motion of the Wind or Air that passeth by it: And these Foundations laid secure, although at that distance, support the Wall in loose and false ground, as though it were entire; but if the ground be very loose, you may project an Arch from each Foundation, though obscurely.

Of Mortar.

It is a great injury to our Buildings, that our Cement is no better: in former Ages, when they built with small and unequal Stones, their Cement or Mortar far exceeded ours, as is most evident in the Ruines of old *Monasteries, Castles, &c.* where their Mortar is far harder than in any of our more modern Buildings.

It is a great error in Masons, Bricklayers, &c. to let the Lime slacken and cool before they make up their Mortar, and also to let their Mortar cool and dye before they use it; Therefore if you expect your Work to be well done, and long to continue, work up your Lime quick, and but little

little at a time, that the Mortar may not lye long before it be used, and with dry Stone, for which the Summer is principally to be elected.

For Brick, if it be in the Winter-time, let them be laid dry; if in the Summer-time, wet: It will quit your cost to emply a boy to wet them in the Summer, for they will unite with the Mortar the better.

The Lime it self in some places is very weak, being made of soft Chalk-stones; the other that is made of harder is much to be preferred.

If you intend your Mortar to be strong where you cannot have your choice of Lime, you may choose your Sand and Water; for all Sand that is dusty makes the Mortar the weaker, and the rounder the Sand, the stronger the Mortar, as is usually observed in water-drift Sand, that makes better Mortar than Sand out of the Pit.

Therefore if you have occasion for extraordinary Mortar, wash your Sand in a Tub, till the Water, after much stirring, come off clear, and mix that with new Lime, and your Mortar will be very hard and durable.

And if your Water be foul, dirty, or muddy, by so much will your Mortar be weaker.

In former Ages they cut their Timber in the Winter-time, when the Sap was most out of it: but now, by reason of the scarceness of Oak *of Mills.* (the principal Timber) our Statutes oblige us to fell it in the Summer for the Bark, being necessary for Tanners, &c. by which means our Timber shrinks, chaps, and decays much more and sooner than otherwise it would do; which inconveniences in square-Timber are not so apparent as in Plank, Board, or suchlike broad and thin work; therefore, in such cases, it requires some kind of seasoning or other to prevent them: if you lay them in the Sun or Wind, they chap, or shrink, or cast.

The best Remedy in that case is to lay them in a Pool or Running-Stream a few days, to extract the Sap that remains in them; and afterwards dry them in the Sun or Air, and they will neither chap, cast, nor cleave. Against shrinking there is no remedy.

When Timber or Boards are well seasoned or dried in the Sun or Air, and fixed in their places, and what labour you intend is bestowed on them, the use of *Lime-Oyl*, *Tar*, or suchlike Oleaginous matter, tends much to their preservation and duration. *Hesiod* prescribes to hang your Instruments in the Smoak, to make them strong and lasting; *temonem in fumo poneret*: surely then the Oyl of Smoak, or the Vegetable Oyl, by some other means obtained, must needs be effectual in the preservation of Timber. Also *Virgil* adviseth the same.

Et suspensa focus exploret Robora fumus.

In ancient times they bruised their Corn in Mortars; since which most tedious and incompleat way, Mills have been invented, some to be used *of Timber.* by hands, as *Querns*, others to be moved by Horses, others by the Wind, and others by the Water; which last being maintained with least Cost, more certainty, and most advantage, hath gained the Preheminence, and is made use of in every place, where there is water fit for that purpose, and where there is employment, although a little for the ease and convenience of the near Inhabitants, and for the particular advantage of the Owner, yet very much to the detriment and damage of the Kingdom in general, by injurious obstructions of water, to the spoiling of much Meadow

dow-ground, and by the preventing the use of the water for that most advantageous improvement of overflowing or drowning of Land ; which upon the removal of these Mills might be done, and the corn as well ground to serve every ones occasions.

Either by Wind-Mills, which may be erected on Hills in Hilly places, and in Plains on any open place, where the Wind may as well grind all your Corn in places where the Water-mills now stand, as in other places where are only Wind-mills for many Miles together.

Or by the Rectification of *Water-mills*, that a less quantity of water may do that which now requires a greater ; to which end many have made very ingenious Attempts, and without question much may be done in it, both in the framing and ordering the *Water-works* (which we will pass by) and in the contrivance of the Mill it self, which doubtless goes much heavier by the stone they call the *Runner* ; its being so large, and its being encompassed with a Hoop or Case that keeps the Meal to the edge or circumference of the Stone, & much deads its motion : The larger the *Runner* is, the heavier it moves ; which may in some measure be remedied, by making four or five vents or passages in several Places of the Hoop, to take off the Meal as fast as it is ground, that none may lye to clog the *Runner*.

Or a Mill may probably be so contrived, that the Grinding-stone or *Runner* may be Vertical, and of but a small circumference ; the flat and square edge whereof may be fitted into another fixed stone cut hollow, about the half or third part of a Circle ; which *Runner*, by its first motion, may dispatch as much Corn in the same time, as a larger the other way. Several also of these Vertical Stones may be on the same *Axis* ; this may be used in all the said sorts of *Mills*.

CHAP. XII

Of Fowling and Fishing.

S E C T. I.

Of Fowling in general.

FOrasmuch as most Farms and Country Habitations lie near unto the Sea, great Rivers, large Fens, Marshes, &c. to which are great resorts of Water-fowl, or else are well furnished with Land-fowl, either of which are very profitable to the Husbandman: Wherefore it may not be amiss to add some general directions for the taking of them; which will redound to his advantage, not only for their Carcasses, but for that many sorts of the Land-fowl are somewhat injurious to his Husbandry.

It is generally observed, that Water-fowl are in their own nature the most subtil and wisest of Birds, and most carefull of their own safety; to which end they do form themselves into an orderly Body or Camp, and have their Scouts and Sentinels at a distance, to give notice of the approach of an Enemy; which they suddenly do by a certain Watch-word, which will oblige you to be more cautious and carefull than ordinary in your endeavouring to surprize them.

It is needless here to particularize the several Haunts of each sort of Water-fowl, seeing there are few that have Lands haunted with them, but they know anear in what parts they most usually frequent. The one sort that are not Web-footed, as the Heron, Bittern, &c. delight most in shallow waters, and boggy Fenny places. The other sort that swim, as the Wilde-geese, Duck, Widgeon, &c. delight most in Rivers, large and deep waters, &c. where they may have plenty of water, and swim undisturbed of Man or Beast; and especially where the water is least subject to Freeze.

The Wilde-geese delight very much in green Winter-corn: Therefore in such Lands that are near the water may you find them.

Most of these Fowl have their Day-haunts and their Night-haunts; for in the Day-time they usually retire to some secure place where they may confidently rest themselves: In the Evening they take to their best Feeding-places, and small green streams, where they dare not appear in the day.

S E C T. II.

Of taking the greater sort of Fowl with Nets.

Let your Nets be made of the best Packthread, with great and large Meshes; for the larger they are, the better, and the more likely they

Of Fowling.

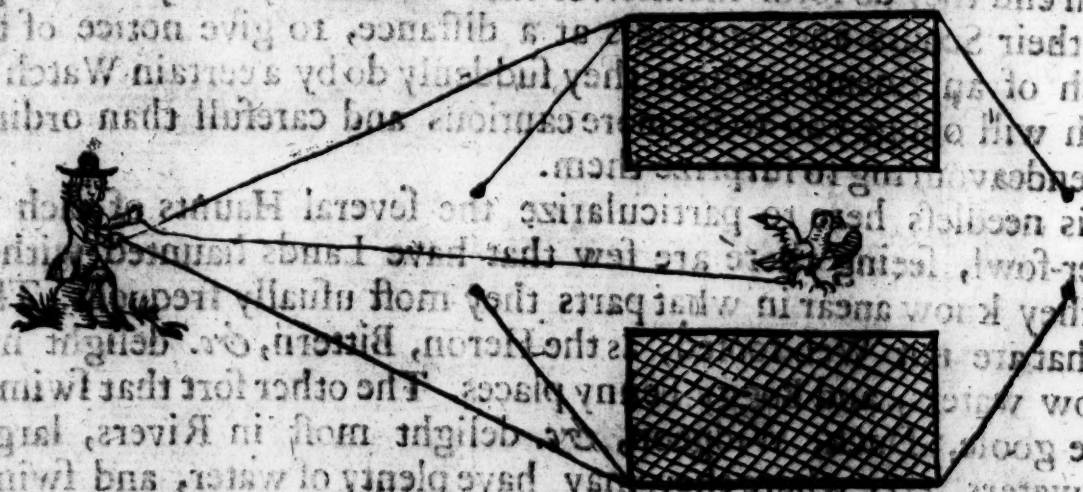
The haunts of Water-fowl.

intangle

intangle them; so that they be not too big to let the Fowl creep through them.

Let the Nets be about two Fathom deep, and six in length: Verge your Net on each side with very strong Cord, and extend it at each end on long Poles; so that the two lower ends of the Poles may be fastened with a piece of Line to two Stakes driven into the ground, at such place where you have observed to be the Morning-haunts or feeding places of these Fowl: being there, place your Net two hours before they come; then at about two or three fathom beyond the Net, in a right line from the two Stakes, fix one end of the cord that the upper part of the Net was extended upon, holding in your hand the other end, which must be at least ten or twelve fathom long; which on the appearance of Game within the Verge of the Net, you may suddenly pull, and cast the Net over them. Let the Net be spread smooth and flat on the ground, and strewed over with Grass, Sedge, or such like, to hide it from the Fowl; and place yourself in some shelter of Grass, Fern, or such like: If you have a Stale, you may place it within the Verge of the Net, which will very much conduce to the encrease of your sport, which you may continue till the Sun be near an hour high; for after that time their feeding in those places is over, untill about Sun set again.

The Form of a Draw-Net.



If your Net be large, and set for great Fowl, one of them will be as much as you can conveniently throw over them; but if you set for small Birds, then two small Nets may be placed after this manner.

SECTION III.

Of the taking small Water-Fowl with Nets.

Let these Nets be made of small and strong Packthread, the Masles proportionable according to the Fowl you design to take: Let the Net be about two foot and a half deep, and of length according to the breadth of the River, or other Waters you intend to place them in, and the Net Lined on both sides with false Nets of Masles eighteen Inches square each way; that when the Fowl strike, they may pass through the first Net, and be intangled between them both.

Stake

Stake this Net athwart the River; the bottom being plumbed, that it may sink about six inches, and the upper part so strained, that it may lie slantwise against the current of the water, about two foot above the water; but let the strings which support the upper side of the Net be fastened to small yielding sticks prickt in the Bank, yielding a little as the Fowl strikes against the Net, the better to intangle them. Place several of these Nets at several distances on the River: and in the night, if any Fowl fall near them, you may be confident of your share.

The better to accomplish your design, deter them from places that lie remote where the Fowl usually haunt, by shooting at them, which will make them take to the River you have thus prepared.

S E C T. IV.

Of taking great Fowl with Lime-twigs.

Besides the Art of taking Fowl with Nets, there is a very ingenious way of taking them with Bird-lime, which seems very ancient; for *Pliny*, who lived above 1600 years since, not only mentions the use of it, in liming of Twigs to catch Birds withall, but the manner how the *Italians* prepared the same, of the *Berries* of *Misseltoe*, of Trees gathered in the Summer-time before they were ripe, and then macerating, putrifying, pounding, and washing it, until fit for use; which also they mix with Nut-Oyl, as in his *Natural History*, lib. 16. you may read. But seeing that that way of making Bird-lime is not in use with us, I shall not trouble you with the whole Process, especially seeing that we have here in *England* a more easy and effectual way of preparing it with the Bark of that common and so well known Tree the *Holly*; which Preparation is thus: Take the Bark of that Tree about the end of *June*, at which time it is full of Sap, and fitter for your purpose; fill your Vessel with it that you intend to boil it in, then add thereto of clear Water as much as the Vessel will conveniently hold, and boil it so long, until the grey and white Bark arise from the green; which will be about twelve or sixteen hours: Then take it off the Fire, and gently decant or pour the water from the Barks, and separate the grey and white Barks from the green, which lay on a Stone floor, in some Cellar or moist or cool place, and cover it over with Fern, or other green Weeds, to a good thickness, the better to accelerate its putrefaction; which will be accomplished in twelve or fourteen days time, and sometimes less, and it reduced to a perfect Mucilage. Then Pound it well in a large Mortar with a wooden Pestle, until it be so tempered, that no part of the Bark be discerned unbruised. After which wash it exceeding well in clear water, by renewing your water and pains so often that no foulness or Motes remain in it; and put it into a deep earthen Vessel, where it will purge it self for four or five days together: Then scum it clean as its filth arises; and when it hath done purging, put it into a clean Vessel, and keep it close for use.

To make Bird Lime.

The Bark of the Birch-tree is by some affirmed to make as good Lime, as that of the *Holly*, being the same way to be prepared; so that you may try or use which is most easy to come by. Also you need not boil either of the Barks, if you give it longer time to putrify; for the boiling is only to accelerate putrefaction.

H h

When

When you intend to use it, take as much of it as you think fit, and put it into an Earthen-pot, with a third part of Capons-grease or Goose-grease well clarified, and set it over the fire, and let them melt together: Stir them until they are thoroughly incorporated; and so continue stirring off the Fire, till it be cold.

If you fear the freezing of your Bird-lime, add in your last mixture a quarter as much of the Oyl *Petroleum*, as you do of the Goose or Capons-grease, and no cold will congeal it.

When your Lime is cold, take your Rods and warm them; then a little besmear the Rods with your Lime, and draw the Rods the one from the other, and close them again. Work them thus continually together, until they are all over equally besmeared.

If you Lime Straws or Strings, you must do it when the Lime is hot, and at the thinnest, by folding and doubling them together before the fire; and fold and work them, till it be all over thoroughly Limed: Put these in Cases of Leather until you use them.

When you intend to use your Bird-lime for great Fowl, take of Rods long, small, and straight, being light, and yielding every way; Lime the upper parts of them before the Fire, that it may the better besmear them.

Then go where these Fowl usually haunt, whether it be their Morning or Evening haunt, an hour or two before they come, and plant your Twigs or Rods about a foot distance one from the other, that they cannot pass them without being intaled, and so plant over the place where their haunt is, leaving a place in the middle wide enough for your Stale to flutter in, without falling foul of the Twigs, which Stale you do well to provide and place there, the better to attract those of its own kind to your Snares: from which Stale you must have a small string to some convenient place at a distance where you may lie concealed, and by plucking the string, cause it to flutter; which will allure down the Fowl in view.

Prick the Rods sloap-wise against the Wind, about a foot above the ground or water; and if you see any taken, surprize them not suddenly if any more are in view, for by their fluttering others will be induced to fall in among them.

A Spaniel that is at Command, will be necessary to retake them that might otherwise escape out of your reach, these Fowl being very strong.

*For smaller
Water-Fowl.*

If you place your Twigs for the lesser Water-fowl, as Duck, Malard Widgeon, Teal, &c. you must fit your Rods according to the depth of the Water, and your Lime must be such as no wet nor Frost can prejudice; the Limed part must be above the water. Here also it will be necessary to have a Stale of the same Fowl you intend to insnare.

S E C T. V.

Of taking Fowl with Springs.

Most of the Cloven-footed Water-Fowl delight in Plashes, Water, Furrows, small Rivolets, and such like places, seeking for Worms, Flat-grass, Roots, and the like, in the Winter-time, especially in Frosty weather, when many other places are frozen up, and these warm Springy Water-tracts are

are open; where you must place *Springs* made of Horse-hair, of bigness and length according to the greatness of the Fowl you design to take; for the *Heron* or *Bittern*, it must be of near a hundred Horse-hairs, and above two foot in length; for the *Woodcock*, *Snipe*, *Plover*, &c. not above eight or ten Horse-hairs, and one foot in length: The main Plant, or *Sweeper* must be also proportionable to the strength of the Fowl. For the manner of the making and setting them, I question not but every place will furnish you with Directors, (if you know it not already) which is much easier and better than any written Instructions. Observe also, that you prick small Sticks, in manner of a Hedge, cross-wise, athwart all the other by-passages, about half an Inch apart, and somewhat above a hand-full above the Water or ground, sloping towards the place where your Spring is placed, the better to guide, (which is easily done) the Fowl into the Snare: for such is their nature, that they will not press over, where they have Liberty to pass through any gap. If the places where these Fowl usually haunt be frozen, you must make *Plashes*; and the harder the Frost is in other places, the greater will the resort of Fowl be here.

S E C T. VI.

Killing of Fowl with the Fowling-piece.

There are many places where *Fowl* settle and feed at some times, yet so uncertain, that the former ways are useless: and there are also many places wherein you may not have the conveniency or liberty to make use of the said ways of taking Fowl; yet there may you at opportune times meet with a good shot with your Fowling-piece, the length and bore of which ought to be proportionable the one to the other, and both to your strength, and the place you use it in.

Let your Powder be of the best sort, as new as you can, for with bad keeping it looseth its strength exceedingly: therefore let it be kept as dry as may be: Let it be well dried when you use it, and clean from dust; it hath the more strength and less fouleth your Piece. Let your Shot be well sized, not too great, for then it flies but thin and scattering; nor too small, the Bird being apt to fly away with it in, having not weight nor strength to enter far.

Shot being usually above the value of ordinary Lead, and in many places not to be had of the sizes you have most occasion for; I shall therefore here set down the true Process of making of it, of what size you please under Mould-shot.

Take Lead of what quantity you please, melt it down in an Iron Vessel, *To make Shot.* stir and clear it with an Iron Ladle, taking off all its impurities that swim at the top: When it is so hot as that the colour of the Lead begins to be greenish, and not before, strew upon it *Auripigmentum* powdered fine, as much as will lie on a shilling, to twelve or fifteen pound of Lead; some will require more: then stir the Lead well, and the *Auripigmentum* will flame. Let your Iron Ladle have a lip or notch in the Brim, for the more convenient pouring out of the Lead; and let the Ladle remain in the melted Lead for the most part, that it may be of a heat agreeable to the Lead, to prevent inconveniencies that may otherwise happen through its being over-hot, or too cold: Then take out a little of the Lead in your

Ladle for an essay, and cause it to drop out of it into a glass of Water ; which if the drops prove to be round, and without Tails, there is *Auripigmentum* enough in it, and the temper of the heat is as it ought to be ; but if the congealed drops or shot prove not round, but with Tails, then add more of the *Auripigmentum*, and augment the heat, until you find it right.

Then take a Copper-plate, about the size of an ordinary Trencher-plate, with a Concavity in the middle about three Inches Diameter, perforated with about thirty or forty small holes, greater or lesser, according as you would have your shot to be ; This Concave bottom should be thin, but the thicker the brim is, the better will it retain the heat. Place this Plate on two Bars, or other Iron-frame, over a Tub or Pail of water, about four inches from the water, and lay on the Plate burning Coals, to keep the Lead melted upon it.

Then with your *Ladle* take off your *Lead*, and pour it gently on the Coals on the middle of the Plate, and it will make its way through the holes in the bottom of the Plate into the water, and fall into round drops. Thus continue your Operation till all the Lead be passed through the Plate, blowing the Coals to keep them alive, that the *Lead* may not cool on the Plate, and stop the holes.

Whilest you are thus pouring on your Lead, another (Stander by) may take another Ladle, and put it four or five Inches in the water under the bottom of the Plate, and catch some of the Shot as it drops down, and see what faults are in it, that you may stop your hand untill they are rectified.

The greatest care is to keep the Lead on the Plate, in so moderate a degree of heat, that it be not too cool to stop the holes, nor too hot, which will make the drops crack and fly : if it be too cool, blow the Coals a little ; if too hot, stay your hand until it be a little cooler : the cooler it is, the larger will be your shot ; the hotter, the smaller. As near as you can, observe the right temper of the heat, and you will have very round shot without any tails.

Then take your shot and dry them over the fire with a gentle heat, always stirring them that they melt not ; and when they are dry you may separate the small from the great, in Sieves made for that purpose, according to the several sizes they are of : But if you would have them very large, you may with a stick make the Lead trickle out of the Ladle into the water without a Plate.

If the Lead stop on the Plate, and yet not too cool, give the Plate a little knock, and it will drop again. Be sure let there be none of your Instruments Greasy, Oily, or the like. When you have separated your shot, if any of it proves too great, or too small, or not round, preserve them for the next Operation.

Thus having your Fowling-piece, your Powder and Shot ready, with your *Spaniel* well instructed, and at command, not daring to stir till you bid him ; then are you fit for a Walk towards your Game. If you are directly between the Wind and the Fowl, they will be apt to scent you ; therefore it's best to go against the wind, or aside it : it's better to shoot at one side of them, than before or behind them ; for if you break a Wing, you are sure of that fowl.

It's best to get as much shelter as you can by Hedges, Bank, or Trees :
for

for the sight or sound of a man raises them, whatever danger of Hawks or any thing else be near.

But if they are so shy, and the place so free from shelter, that there be no way to come at them fairly, then you must lead forth your *stalking-horse*, being some old Jade trained up for that purpose, and that will be led in your hand as you please, and not startle much at the report of a Gun; behind whose shoulders you must shelter your self, and take your aim before his shoulders, and under his Neck, which is better than under his Belly.

If you have not such a Beast ready, you may make an Artificial one of any old Canvas, in shape like a Horse feeding on the ground. You may make it double, and stuff it; or single, and Painted of a brown colour like a Horse: Let it be made on a sharp stick, that you may fix it into the ground as you have occasion, when you take your Level.

It must be so light that you may carry it in one hand, and high enough to conceal your body from the Fowl. You may also make an artificial Ox or Cow, which you may use for a change, for when your Horse is discovered through much use, you may change for the other, and so make your sport dure the longer: Or you may make Artificial Stags or Bucks with their real Horns on them, which will be best in such Grounds where those Creatures frequent, and with whom the Fowl are more familiar.

You may either make the representation of a Tree in Canvas, and painted like one, and so spread with small sticks that it may somewhat resemble a Tree, or you may with many Boughs so form a Tree, that it may shelter you from the view of the Fowl, making it with a spike at the bottom, that it may stick into the ground when you aim at your Game.

A short Digression concerning Decoy-Ponds.

Falling into this discourse concerning Water-fowl, I cannot omit to give you some encouragement to prosecute this most ingrossing way of taking them by Decoys; that which unless seen or known, may seem incredible, how a few subtil Fowl should be able to draw, decoy, or trepan such multitudes of their own kind into a known Snare, and there leave them to their unfortunate ends; such unnaturalness being not to be paralleled in any other Creature whatsoever. They are a peculiar Species of that kind of Fowl, and are from the Egg trained up to come to hand. The manner of doing it, and making of the Pond, and the several Apartments belonging unto it, requires a skillfull Artist, and not Book-directions.

That they are of considerable advantage, is not to be doubted, there being many of them erected in the Maritime parts of this Kingdom, the Gain whereof is from the vast numbers of them taken in the Winter-time, which are supplied from the more Northern Regions, whence the Frosts, Ice, and Snow Banish them into the more Southern. The Decoys flying abroad light into their company, and soon become acquainted with them, and allure them being strangers; and they willing to follow them in hopes of good quarters, are by these Decoys brought into the very place, where they become a sufficient reward to the owner of the Decoy, and a great supply to the adjacent Markets.

To find Duck
Eggs.

I may also subjoyn; that in those Countries where the Wild Duck breedeth, you may go into the Fens, Marches, or places with a Spaniel, or other Beating-dog; and where the Dog puts up any Duck, or you otherwise find a Nest with many Eggs in it, in the Month of *March*, before Sitting time, you may take them away out of the Nest with an Iron Ladle (lest you handle or breathe on the Eggs, and the Duck by your scent forsake her Nest) leaving two or three in it to encourage her to lay again there; which she will do, it being their nature to lay till the Nest be full. So once a week you may fetch them away, taking the oldest away as near as you can. Let the handle of your Ladle be of wood, about two or three foot long, that you may not go too near. These Eggs may you set under your Hens or Ducks at home, the encrease whereof are much to be preferred to the Eggs of tame Ducks: only observe, that if they have opportunity, they will take their leave of you, unless you have places secure for them to feed in; for the Bird it is of the Nature of the Egg, and will be wilde when old enough to take wing, or hath the opportunity of a Stream to carry it away. But if you have conveniency to make you a Duck-house and Duck-ponds, with convenient Receptracles for them to lay their Eggs in, and secure their Brood, they will never forsake you, but make that place where they were bred, their place of refuge, and constant abode by day, although they prey abroad in the night. They will also, much after the manner of the Decoys, bring many to them in the Winter-time.

S E C T. VII.

Of taking Land-Fowl.

Those that are usually termed Land-Fowl, are such that live and make their haunts generally in the Woods, Fields, Heaths, &c. as the Pheasant, Partridge, Poults, Quails, Rails, Wood-Pigeons, Black-birds, Throftles, or Thrushes, Field-fares, Larks, wheat-Ears, &c. all which are diversly taken and insnared. The most part of them, by the cunning skill of the Fowler, are shot with a Fowling-piece, either perched by a Dog, or otherwise, or flying, wherein many have a very excellent Faculty, more rarely missing that way then Perched; which by practice may be easier attained unto, than by any Rules or Precepts.

Of taking
Fowl by Day
Nets.

Any Fowl that gather together many in a flight, may be taken in Nets by day; as *Pigeons, Larks, Sparrows, Crows, Rooks, &c.* and that either by baiting some place for them in their usual haunts, or by laying the Net in such haunts, and wheedling them in by a Stale, or some other enticing way. The manner of setting and placing such Draw-net you have before described; only you must have the Mashes and the length and depth of your Net, proportionable to the Game you design to take.

Of taking
Larks by day
Nets.

If you place these Nets for *Larks*, the season is from *August* to *November*: the earlier you set them in Morning, the better; and the brighter the Sun, and the milder the Air, the better will your sport be.

The open, plain, and Champion-lands, are the places for this sport, especially on the Barley-edishes.

The

The only way to intice the *Lark* into your Snare, is to place in the middle of the Verge of your Net an instrument made to move nimbly, by plucking it with a small Line or Packthread to and fro; on which should be fixed some pieces of Looking-glass, that by the continual whirring motion of it, the glittering of the Looking-glass by the reflection of the Sun in the eye of the *Lark*, allureth her down to the Net, especially if there be a *Stale*.

When one or two are in the compass of your Net, let them alone until they attract more company to them: preserve some of them alive that you take, for *Stales*.

But if you cannot conveniently get a live *Stale*, shoot a *Lark*, and *A dry Stale*. draw out his Intrals, and dry him in an Oven in his Feathers, with a stick thrust through him, to preserve him in a posture convenient: This *Stale* may serve near as well as a living one. Thus you may make *Stales* of any sorts of Birds, and keep them by you without any daily charge or trouble as living *Stales* put you to.

There is another way of taking the timorous *Lark* by a Day-net, made in form of a Scoop-net that they usually take up Fish withall out of Stews: which Net you must make of the finest thread, or you may make a small Trammel-net to draw over them; having either of these Nets ready, then with a *Hobby*, either dead or living, (or any other Hawk will serve indifferently well) go into the Fields, where *Larks* usually are about Harvest, and beat them up with a Spaniel, and observe where they pitch: Then hold up your Hawk as high as you can, the sight whereof will cause the *Lark* to couch very close, that you may cover her with either Net; for she is so fearfull of the *Hobby*, that about this Season preys on that Bird, that she will suffer you almost to take her with your hand, rather than adventure her self in the Air.

These *Hobbys* have always been a Terror to the *Larks* in other Countreys as well as in this, which was meant by the Poet when he thus sang of *Scylla* being persecuted by *Nisus*.

*Nisus appears high in Aethereal Air,
Tormenting Scylla for his Purple Hair;
Where e're she cuts with fanning wings the Skies,
After, her Persecutor Nisus flies:
Wherever Nisus the first Clouds divides,
Scylla from thence with all her forces flies.*

This sport lasts till about *Michaelmas*, at which time the *Hobby* leaves this Country, or that Exercise; and then the *Lark* is more confident.

If you cannot, through want of time or skill, accomplish your ends in this Pleasure or Recreation by day, you may more easily do it in the night several ways: If in Champion and level Countries, then by a Low-bell, from the end of *October*, until the Birds begin to couple towards the Spring; and in the darkest nights, or at least the dark time of the night, your Bell must have a hollow, deep, and dolefull sound. Your Net must be about twenty yards deep, and so broad as you can conveniently manage it: Then go in the Scubble-Fields, where the Birds usually rake up their Night-quarter; the *Wheat-Eadish* is the best. He that carries the Bell must go foremost, tolling the Bell very mournfully, and not too hard;

*To take Birds
with the Low-
Bell.*

hard; then let the Net follow, being supported at each Corner and on the sides; and when you come where you think the Game lies, pitch your Net, no noise being hitherto heard but that of the Bell: then light your Straw or Torches, at the Coals or Candle carried in a Dark-Lanthorn, by one to that purpose, and beat the ground and make a noise; and the sight of the fire or light will make them instantly rise, and be intangled in the Net: Then put out your lights, and keep your usual silence, and proceed as before. Thus may you take Partridge, Rails, Quails, Larks, &c.

To take Birds
with a Trammel
net only.

You may also take the same sorts of Fowl by night with a Trammel, being a Net longer than that you use with the Low-bell, the lower part of it plumbd with Lead loose on the ground, the upper part supported at each end about three foot high; and so trailed along those grounds you expect your Game on. At each side of the Net carry Wisps of Straw burning, or Links, and let some beat the ground with long Poles; which will cause the Birds to rise against the Net.

For fowling.

There is also a way to take Birds in the Night-time, that Roost or Perch in Trees and Hedge-rows, which is called *Bat-fowling*. The manner is thus: When you come to the place where you expect your Sport, light your Straw or Torches, and beat the Bushes or Hedge-rows, and the Birds will instantly fly towards the flames; where you may take them either with Nets at the end of Poles, or beat them down with Brushes made with Boughs at the end of Poles, or by carrying large boughs limed with Bird-lime to intangle them. This Sport is to be used when the weather is extream dark, and with great silence till the Lights are burning; for they are amazed at the light, being every way else very dark, and fly to the very flames; so that you may take them as you please.

To take small
Birds with
Lime-twigs.

The manner of using Bird-lime you have before in this Chapter; but for the taking of small Birds, the best way is to take a large Bough of Birch, Willow, or such like Tree; prick and trim it clean from all superfluity, that the Twigs may be smooth; lime the branches very well, but not too thick with the Lime: then place this Bough in such place where those Birds usually resort that you design to take, standing like a Tree; & place your self at some convenient distance undiscovered, imitating either with your mouth, or some Bird-call, the Notes of the Bird you aim at, which you must by practice learn; which will invite the Birds to the Tree you have prepared for them. Thus from Sun-rising to ten of the Clock, and from one till near Sun-set, may you use this Sport.

To take small
Birds with
Night-bats.

Or you may lay small Twigs limed, and about three or four inches long, in places where the Birds haunt; or stick them on the tops of Hemp-cocks or Wheat-sheaves, or stick small Boughs among Pease, which the small Birds will suddenly pitch upon; which will be a means to lessen the number of those destroyers of Corn, Grain, Seed, &c. But if you use a Stale of one or two living Night-bats, placing them aloft, that the Birds may gaze at them; or an Owl, which is the better of the two, most sorts of Birds will draw towards her, and so fall into your Snare: A dried Owl will serve for want of a living one.

To take Field-
fares or Bow-
Thrushes.

Also in Winter-time the *Field-fares* and *Bow-thrushes*, which usually fly in great Flocks, are easily taken, by Liming two or three large boughs, and fixing them on the top of some tall Tree, and placing in them two or three dried Stales of that kind, and beat the Fields adjacent where those Birds feed, and they will in great flights take to that Tree where your Stales are, for your great pleasure and profit.

S E C T.

S E C T. VIII.

Of taking Fowl with Baits.

Land-Fowl, as *Doves*, *Pigeons*, *Rooks*, *Choughs*, and such-like, may be taken with Baits; as by boyling Wheat, Barly, Pease, or other Grain in Water, with good store of *Nux Vomica*; and when they are boiled, almost ready to burst, take them out and let them cool, and scatter this Grain where these Birds haunt; and it is said, that by eating of it they will fall as dead, that you may take them with your Hand: if you boil smaller Seeds, you may take smaller Birds by the same way.

They also say, that the said Grains or Seeds steeped in the Lees of Wine, will work the same effect; which if it doth, it is much the cleaner way, and doth not infect the Bird with that poysonous quality, as doth the *Nux Vomica*.

It is also said that *Bellenge*, Leaves, Roots and all, cleaned very well, and steeped in clear running Water for twenty four hours, and boiled in the same Water till the Water be almost consumed. Then when it is cold, this Plant being taken and laid in the haunts where Wild-Geese, Duck, Mallard, Bustard, or any other Fowl affecting the Water usually frequent, that these Fowl will feed on it, and be stupified or drunk therewith; and the more, in case you add a little Brimstone in the Concoction. But this is left to the experience of those that know the Plant, it's Virrues, and the inticing quality it has to invite the Fowl to tast it.

S E C T. IX.

Of taking some sorts of Fowl.

Thus have I given you a hint of the divers ways of taking Fowl in general; but something more may be said as to the particular ways used in taking some sorts of Fowl, that are not proper for any other: As in taking the *Pheasant*, much skill is used and imployed in taking him being the best of all Land-Fowl that are wild. The one way is, after you have found their haunts, which are usually in young Copples, where you must carefully view the several places, and by that means may find them, Young and Old together. Provide your self with a *Pheasant call*, and learn all their distinct Notes; and having a Net made of Blew or Green Thred, about sixteen or eighteen Foot long, and seaven Foot broad, verged with small Cord, go into the Woods where these Fowl are, and make use of your Call first softly; and so increase your Note, untill you hear them answer; then approach by degrees towards them, untill you are in view: then spread your Net with as much secrecie and silence as you can, at some distance from the ground, fixing the one end to the ground, and holding the Line in your hand, withdraw your self to some convenient distance, and use your Call again; and when you perceive the *Pheasant* under your Net, then rise up and shew your self; and as the *Pheasants* rise, they are intangled in your Net.

When

To drive
young Pheasants.

When you have found an Eye of *Pheasants*, and their Rode or Tract in the Copses where they usually run, then place your Nets, hollow, loose, and circular-wise, that when the Birds are in, the Nets may fall on them and intangle them: Then with a Driver, being a bundle of Wands or Rods, a little stir the Bushes or Trees, making some noise, the young Pours will then run forward; and as they stand, you must still keep raking with your Driver gently, only to frighten them forward until you have driven them under your Nets. You must be sure to conceal your self from the sight of them, and not drive them too hastily, lest they straggle abroad, and hide themselves where you cannot find them.

To take Pheasants with
Lime-twigs.

In the Winter-season when the Leaves are off the Trees, then may you take these Birds with Lime-twigs, either stuck fast in the ground, or laid loose in the paths where they usually frequent; then with your Call, keeping your place where you first set your self, you may induce them to come towards you, and be intangled in the Twigs: when one is intangled by her fluttering, she will go near to intangle all the rest by their coming to assist her. It will be necessary to have a Spaniel at hand, lest any of them escape with the Twigs.

To search
Pheasants.

The most usual Method of taking this Fowl, is by a Spaniel that is brought up to the Sport, which will hunt after them; and when he hath discovered a Pheasant, she will immediately take to a Tree, at which the Spaniel will Bay; whereby you have notice (if within hearing,) where the Pheasant is, whose nature is to eye the Dog, knowing her self to be out of his reach, and not to regard any other danger, though never so near, that you may command her at pleasure with your Fowling-piece.

To take Partridges.

Next unto the *Pheasant* the *Partridge* is preferred to any Land-Fowl, and is to be taken divers ways: their haunts are easily known; scarce a Carter or Day-Labourer that useth the Fields, but can tell you where these Birds usually resort; but to find the *Covey* in such haunt, is the difficulty, some are so ingenious they can do it by the Eye, only distinguishing their colour from the Earth; others by a Call, imitating their Notes at their Joking-time, which is usually in the Morning and in the Evening.

With the
Trammel-
Net.

Having discovered them, draw forth your Trammel-Net, and take a large circumference, with a good round pace and careless eye, nearer and nearer towards the Birds, until your Nets are trimmed and fitted for your purpose, and you within the Nets length of them; then prick down the stick to which one end of the Net is fastened, and walk round till you cover them; then let down your Net, and rouse them up that they may be intangled.

To take Partridges with
the help of the
Setting-Dog.

Having a good Setting-dog well taught and at Command, he will soon discover to you where the *Covey* lies: then trim your Nets, as before is directed, and cover them. If there are two of you together, the one may hold one end of the Line, and the other the other end of it; and so draw the Net over them.

To drive
Partridges.

There is a very pleasant way of driving Partridges into a Tunnel-Net; which when you have discovered the *Covey*, you must place beyond them, having the Wind with you, that you may drive them with the Wind. The Net must have two long wings, extending each way wide and upwards towards the Birds, a little hovering over: then take your artificial Stalking Horse, and covering your Face with something dark, Blew, or Green, you may easily drive them before the Wind into the Net; the sides whereof will direct them into the Tunnel, where you are sure of them.

As

As you were directed for the Pheasant, so may you lay limed straws, cut off between knot and knot, in the haunts of these Birds; and with your Call draw them towards you; that in their way they may fall foul of your limed Straws: As soon as the one is intangled, all the rest will be quickly after; for they run together like a brood of Chickens, and will besmear one the other, that few of them will escape.

The usual way of insnaring any manner of wild Creature, is to understand what they most delight in, either for Food or Exercise; and therein to place your design in betraying or insnaring them. As for the Woodcock, he is a Bird that is somewhat troublesome to discover, whereby to Command him by a Fowling-piece; and in his place of Feeding, tedious to take, by reason there goes but few in a company: Therefore where they usually haunt, it is observed that they take a great deal of pleasure in flying in the Night-time through open places in tall Woods, especially in a dim Moon-light night: So that several persons where they have thick Woods standing on some brow of a Hill, have cut a passage straight athwart the Hill, through which the Cocks in the night-time fly to and fro for their pleasure, and will, if any near, draw to that place on purpose for that Exercise: Between which Trees if you place a large and fine Net before Night, you will be sure in the Evening to have them intangled in your Net, as they endeavour to fly through their usual Road, where one ought to attend to take them as soon as in the Net.

There is scarce any Bird that flies, but there is some peculiar way of discovering or insnaring him, different from Another: as the Quail or Rail, by Pipes or Calls; the Moor-poot, or Heath-poult, discovered by their Eye, and several others.

In June and July when the young Heath-poults are in their prime, and as yet not very strong winged; with a good Spaniel may you take many of them; but if they are strong in the wing, then after a shower hath well wetted their Feathers, they become weak and more easily taken. Which several ways we leave to the more experienced, and to the several practices of the several places where they usually frequent.

Of Fishing.

AS the Art of taking Fowl is very necessary to be known of most Countrey-men; so also is the Art of Fishing, especially to such as live near to great Rivers, where they are bred and fed without any charge, labour, or damage to the Countrey-men that inhabit by such Rivers; and so become very profitable to those parts through which such Rivers run, and to those that have the privilege and skill to take them.

Fish are divers ways taken; either by Nets, Pots, or Engines, by Angling, or by stupifying Baits, inticing or alluring objects; and these ways are used either by day or by night: Also at different seasons of the year, the Fish as well as Fowl having their Seasons; of all which we shall give you some hint.

S E C T I.

Of taking Fish by Nets, Pots, or Engines.

To Fish with
Nets.

The usual way of Fishing by Nets is of the greatest advantage, and so of greatest destruction to those watry Animals, which if not moderately, destroys whole Rivers of them; to prevent which, there are several good Laws made, though seldom executed. And could all Men that are concerned in this Exercise agree to neglect the use of Nets but for two or three years, the Fish would encrease innumerable, that in many years after they could not be destroyed; which being very unlikely, yet it were feasible to compell all Fishermen that they take no young Fish, nor Fish in their Spawning Months: for if they were permitted to spawn but once before they are taken, they would sufficiently stock the Rivers where they are; for the destruction of Fry and Spawns is the ruine of the Fishing in most Rivers.

With the
Trammel
or Sein.

The most usefull Nets in great Waters are the *Trammel* and *Sein*; which according to their Mesh, may be used for most sorts of Fish: The making and manner of using them are known to most Fishermen.

With the
Casting-Net.

The most pleasant and recreative way is the *Casting-net*, spreading like a Cloak, and verged round with Plummers, that over whatsoever Fish it is thrown, it brings them to your hand. This Net is either thrown off from the Bank-side, or from a Boat, according as the Water will give you leave: if the remarkable places that you intend to sling at were baited before-hand, your sport would be the better.

With the
Shove-Net
or Poke-net.

In smaller Rivers, where there are Roots or Stems of Trees, under which the Fish usually seek for shelter in the day-time, the Net vulgarly called the *Shove-Net*, which is a Net broad and open before, about five Foot, and ending backwards in a long and narrow Cod. The forepart of this Net is fixed to a semi-circular Rod, and to the string that strains the two extrems of that Rod, in form of a Bow-string: In the use of it, you pitch the straight side of the Net downwards against the place or shelter where you suppose the Fish are; which Net you hold strongly against the place, by the help of a Stail or Handle that is fixed athwart the Bow, and extends down to the string: Whilst you thus hold the Net, your companion with a Pole stirs in the place of refuge; and what Fish are there will suddenly bolt out into your Net. By this means, not only Fish in small Rivers, as *Troats*, *Humpers*, &c. are caught, but Salmon also in great Rivers, where the water is thickned by the Tide; the Fisherman standing against the Water with the Cod of the Net between his Legs, and as soon as he perceiveth the Fish bolt into the Net, he forthwith lifts it up.

With Fish-
pots.

In several great Rivers where shelter is scarce, many have set large Pots made of Osier, with bars in them, that when the Fish are in them, driven either by the Current, or seeking therein for shelter, they could not get out again. They are also laid in swift Currents, and at Mill-tails, and such like places, for the taking of Eels, which in dark nights, warm weather, and thick waters, run down with the stream in great plenty.

In

In great Rivers, the greatest destruction of Salmon, and also advantage, is made by Wears erected in the main Stream, that when those Fish whose nature is to swim against the Stream, and to spring or leap over any natural obstacle that shall oppose them, by their endeavour to raise themselves over these Wears, try to leap over, they fall short, and are taken in Grates set at the foot of them for that purpose. Many other Engines there are to intercept their passage up against the Waters, none of which are very injurious to the increase of that Fish, were they discontinued in the Autumnal season; at which time those Fish stem the swiftest Currents, that they may lay their Spawn in the small shallow streams; which Nature hath instructed them to do, it being the sweetest meat other Fish can feed on, and so consequentially the best bait for a nimble and greedy Angler: At which season those that do escape these destructive Wears, are too often met with by the ignorant Rustick, who with his Spear commonly assaults them in the Shallows; and after these Fish have spawned, and their Spawn converted into the young brood, the Spring following they naturally descend with the Stream, and by greedy Millers, and others, are commonly the greatest part of them intercepted in their Pools; yea, sometimes in so great quantities, that for want of a present Market they have given them to their Swine. All which are the principal causes of the great scarcity of that Fish in these parts of England.

There is a sort of Engine, by some termed a Hawk, made almost like unto a Fish-pot, being a square frame of Timber fitted to the place you intend to set it in, and wrought with Wire to a point almost, so that what Fish soever go through the same, cannot go back again. These placed the one where the River enters into your Land, the other where it runs out, with the Points of each towards you, any Fish whatsoever that moves with or against the Water, when they are once within the Hawks, cannot get back again. In case the River be broad, you may place two or three of these at an end in it; a frame of Timber being set in the Water that it break not out on either side, nor under, lest your Fish escape. These Hawks ought to be made moveable, to take off or on, as you see occasion.

But in case you are in danger of Land floods, or that you have not the Command of the Land on both sides, or of fish-like impediment; then may you cut a large Channel out of the sides of the River, and as deep as the bottom of the River, with some part of the Current through it, and place these Hawks at each end of it, the better to intice the Fish into it. At some convenient distance from the River, and in the Piscary, on the top of a stake pitch'd in the midst of the Water, and a little above the Water fix a Laton-Case, in form of a Cylinder, about three or four Inches Diameter, and twelve Inches long, in which set a Candle burning in dark nights, the light whereof shines only upwards and downwards: It must be open at the top, because it preserves it burning: the downward Light intices the Fish into your Piscary; so that no Fish passes up nor down the River, but will seek their way through the Hawk into the light. By this very means I have known a Piscary well stored in a few nights.

There is a Net made round, and at each end a Hawk, that being set in the Water and depressed by Plummets or stones, and having in the inside thereof shining shells, or red Cloth, or such-like inticements, the Fish will seek their way in, but cannot get out.

As

As for Fishing in the night by Fire, and stupifying of Fish with unwholsome Baits, or with Lime, or such-like, being ways used by evil-minded persons, that rather destroy the properties of other men, than lawfully use them for their necessary subsistence; I shall decline any Advice or Directions in that kind, and prosecute that most lawfull, just, and honest way of Angling, so much celebrated by the Ingenious of every degree.

S E C T. II.

Of Angling.

There is not any Exercise more pleasing nor agreeable to a truly sober and ingenious man, than this of Angling; a moderate, innocent, salubrious, and delightful exercise: It wearieth not a man over-much, unless the Waters be remote from his home: it injureth no man, so that it be in an open large water; he being esteemed a Beast rather than a Man that will oppose this Exercise: neither doth it anywise debauch him that useth it: The delight also of it, rouzes up the Ingenious early in the Spring-mornings, that they have the benefit of the sweet and pleasant Morning-Air, which many through sluggishness enjoy not; so that Health (the greatest Treasure that Mortals enjoy) and Pleasure, go hand in hand in this exercise. What can be more said of it, than that the most Ingenious most use it?

Observations
in Angling.

No bright
Apparel.

Bait the
stream or
place.

Provide good
Rods.

The Line.

When you have any leasure days or hours from your ordinary Profession or Employment, you cannot better spend them than in this innocent Exercise; wherein observe that your Apparel be not of any bright or frightening colour, lest that drive the Fish out of your reach, or make them timorous.

That you bait the place you intend to Angle in, with such things the Fish you aim at generally affect, for several days before you Angle, if it be a standing or quiet Water, but if a swift stream, there is no great need of any; but if you do, let it be but a few hours before, or just at your Angling-time, and that above your Hook.

The best time to provide Rods and Stocks is in *December* or *January*, before the rising of the Sap; when gathered, dry them by degrees, in a smoaky place is best; they are better to use at sixteen Months old then sooner. To preserve them rub them over with Linseed-Oyl, or sweet-Butter never Salted, twice or thrice a year: If your Stock be hollow, fill the bore with Oyl, and let it stand twenty four hours, and then pour it out again; this will preserve it from injury.

If the top of your Rod be brittle or decayed, you may whip on a piece of Whalebone made round and taper, which will be better than the natural top.

In making your Lines, observe, that for most sorts of Fish the Hair-Line is the best, because it is not so apt to snarl as other Lines, and will yield to the streining of the Fish very much before it will break; which is a very great advantage in the taking of a stubborn Fish. Let the Hair be round you make your Line withal, and as near as you can of a size: Also you may colour your Hair of a Sorrel, Grey, or Green colour; but then they are a little weakened by the colouring.

It is good to provide your self with all sorts of Hooks; the smallest ^{The Hooks.} to take the smaller Fish withall, and the greater the greater Fish. Also with Hooks peculiar to the Jack or Pike, and Hooks to lay for Eels.

Your Flotes may be made of Quills, or of Cork and Quills, which are ^{The Flote and Plum-} the best, and least offensive. Let your Plummer wherewith you sound the depth of the Water be of Lead, about the weight of a Musket Bullet; which is very convenient to know the depth of the Water by.

According to the nature of the Fish, so you must provide your self with ^{Baits.} Baits. Herein observe, that if you open the first Fishes Maw that you take, you may see what that Fish most delights in for that season. If you use Paste for Baits, you must add Flax or Wool, to keep the Paste from washing off the Hook. The Eyes of the Fish you take are good Baits for many sorts of Fish; for the Trout, Flies, and Palmer-worms made artificially, are the best Baits in clear Water, the Season being observed wherein each of them is to be used: Any Bait annointed with Gum of Ivy dissolved in Oyl of Spike, or with the Oyl of Ivy-berries, or the Oyl of Polypodie of the Oak mixed with Turpentine, will be great inticements to Fish to bite.

It is best Fishing in a River a little disturbed with Rain, or in Cloudy ^{Season for} weather; the South-wind is the best, the West indifferent, the East the worst: but if the weather be warm, and the Sky Cloudy, they will bite in any Wind. Keep your self as far from the Water-side as you can, and fish down the Stream. In a swift stream where the bottom is hard, and not too deep, if you go into the middle of it and cast your Fly up against the Stream, the Trout that lies upon the Fin in such strong Currents, and discerns you not, being behind him, presently takes your bait.

In March, April, and September, and all the Winter-months, it is best fishing in a clear, serene, and warm day; but in the Summer-time, in the Mornings, Evenings, and coolest cloudy weather.

After a clear Moon-shiny night, if the day succeeding prove Cloudy, is a very good time for Angling: for it is the nature of most Fish to be fearfull to stir in bright nights; and so being hungry, if the weather in the Morning prove Cloudy, they will bite eagerly.

To the intent that you may not labour in vain, I shall give you a hint ^{Seasons not} of such times that Fish delight not in biting; though some that have more ^{to Angle in} than ordinary skill, may possibly take a few at any time.

In the extremity of heat, when the Earth is parch'd with Drought, there is little sport to be obtained; nor in frosty weather, the Air being clear, unless in the Evening; nor in high Winds; nor in sharp North or East-winds; nor immediately after Spawning-time, their hunger being abate, and the Fish not worth taking: Nor yet after a dark night, for then the greater Fish have been abroad, and satiated themselves; but the little Fish will bite best, having absconded themselves all night for fear of the greater.

The greatest Fish bite best in the night, being fearful to stir in the day: Therefore that is the best season to Angle for them.

SECT.

S E C T. III.

Of Angling for Salmon and Trout.

The *Salmon* and *Trout* are Fish much of a Complexion and Nature, different in their Seasons from other Fish: The way of Angling for them is much after the same manner.

Salmon,

The *Salmon* biteth best in the Summer-Months, about three of the clock in the afternoon: He keeps not to one haunt, but swims generally in the deepest and broadest parts of the River, near the ground; and is caught with Worm, Fly, or Minnow. The Garden-worm is an excellent bait for a *Salmon*, if kept in Moss about twenty days; which will scoure them, and make them tough and clear.

You may also troul for a *Salmon* as you do for a *Pike*, with a Trouling-Rod and Line.

Your Artificial Flies for a *Salmon* must be larger than for a *Trout*, and the Wings and Tail long.

In Angling for a *Salmon* at ground, put two or three Worms at a time on the Hook, and give him time to gorge the Bait.

Trout,

The *Trout* is also taken with Worm, Minnow, or Fly. To fish for them in the night, which is the best time for the great *Trouts*, take two great Worms of equal length, and put them on your Hook; cast them at a good distance from you, and draw them to you again on the top of the Water, not letting them sink, and give the *Trout* time to gorge his Bait. Instead of these Worms, you may use a black Snail, or a piece of Black Velvet, which is as well: They bite in the night best in the still Deeps, but then unusually in the Streams.

If you bait with a Minnow, you must place it so on the Hook, that the Minnow must run round as you draw it towards you; and to that end you must have a Swivel on your Line, lest the running round of the Minnow over-twist your Line. The same may you do for a *Salmon* or *Pike*.

If you bait with Flies, or Palmers Natural or Artificial, be sure to observe the Season, what Palmer or Fly they most delight in at that time that take, or imitate it as near as you can.

S E C T. IV.

Of Angling for the Pike and Perch.

These are two sorts of White Fish, that Spawn in the Spring early, and are greedy Fish of Prey, especially the *Pike*, which will prey upon its own Kind.

Pike,

You may take the *Pike* by hanging your Line to a Tree on the side of the River, with a living Bait on the Hook, as a Minnow, Dace, Roach, or yellow Frog; but let not the Line hang at the full length, but contracted into a cleft stick, that when the *Pike* bites he may easily draw it out, and have time and scope enough to pouch his Bait.

Or you may Trowl for him; which must be with a very long Line wound up at the handle of your Rod on a small Winch or Windlace; and at the top of the Rod, which is stubbed, the Line must go through a Ring,

Ring, that when the Fish hath taken the Bait, he may, by your letting him have Line enough, gorge his Bait, and hang himself. Your Line must be strong, and Armed with small Wire next the Hook, about seven or eight Inches.

You may Fish at Snap with him as with other Fish, if you please; but your Tackling must be very strong.

A *Pike* bites at all Baits except the Fly, and bites best at three in the afternoon, in clear Water, with a gentle Gale, from *Midsummer* to the end of *Autumn*. In Winter he bites all day long: In the Spring he bites in Morning and Evening.

The best time to take the *Perch*, is when the Spring is far spent; for *Perch*. then you may take all near you at one standing.

His Baits are the Minnow, little Frog, or a small Worm: He bites well all the day in cloudy weather, but chiefly from eight to ten, and from three to six. He also bites at almost any Bait.

S E C T. V.

Of Angling in standing-Water, for Pond-Fish.

The Fish that are most usual in standing Waters or Fish-ponds, are the *Carp* and the *Tench*: Some there are that are common to both, as the *Bream*, *Dace*, *Roach*, *Eel*, and *Perch*. Angling for Pond-fish is the most easy of any way, and where there are a good stock, much sport there is.

The *Carp* is the best of all fresh-water Fish, and will live the longest, *Carp*. except the *Eel* out of the Water. This Fish is very subtle, and biteth but seldom, and that in warm weather, cloudy; early in the Morning, or late in the Evening.

The Baits for a *Carp*, are either Worms or Pastes. A Paste made up of Bean flower, Honey, and a little *Assafetida*, hath proved very well. Others have prescribed Bean flower mingled with the flesh of a Cat cut small, and beaten very well in a Mortar with Honey, so long, till the whole is so tough to hang on a Hook without washing off. A little Wooll added in the making of it up, will make it hold the better.

Gentles anointed with Honey, and put upon the Hook with a piece of Scarlet dipt in the same, is esteemed the best of all Baits for the *Carp*.

The *Tench*, for his sliminess, accounted the Physician of Fishes, delights *Tench*. only in standing Waters, and especially among Weeds, Flags, &c. In the hottest weather, early and late, and all the night, this Fish delights most to bite.

He delights in the same Baits as doth the *Carp*. The stronger the Pastes are of *Assafetida*, or other Gums or Oyls, the sooner he will bite.

The *Dace* is commonly a River-Fish, yet doth very well in Fish-ponds, *Dace*. if any think it worth their costs and pains to keep them there: But in either place the best Baits for them are Flies, whereof they Affect the Ant-Fly above the rest. For ground-Baits, the Grub that is found in Ploughed-grounds, Gentles, and the young brood of Wasps, or such-like, are very good: Small Worms, Pastes, and such-like, they will not refuse.

The *Roach* is much of the same nature as is the *Dace*, but more usual *Roach*. in standing Waters than the other: Worms and other ground-Baits, are most proper for them.

Bream.

Though the *Bream* be found in some Rivers, yet it is most usual and best in Ponds or standing Waters. The best time for Angling for them, is from the end of *July* untill *Autumn*; for in *June* and beginning of *July* they Spawn, and are not in their season. The best bait for them is the Red-Worm that usually lies at the root of the Dock: They also bite at Pafts, Wasps, Flies, Grashoppers, &c.

Although the *Bream* be esteem'd as a mean Fish, yet where they are preserved in good Water, till they are at their full growth and fat, they are a most excellent Fish.

As for the *Perch* you have directions before, concerning the taking of him in Rivers, the same will serve in Ponds.

Eels.

The *Eel* is a Fish that delights in obscure places, whilst any light either of the Sun or Moon appears, being a sweet Fish, and a prey to Fowl as well as Fish, but in the night-time, and the darker the night the better. This Fish wanders abroad out of her lurking places, and preys on any bait that is fleshy, either Worms, Snails, raw Flesh, Frogs, young Birds, or the like.

By Angle.

You may Angle for them in the night in standing Waters, as you do for other Fish, and they will bite, so that you lie near or on the ground.

With Bank-hooks.

Also you may bait many Hooks over night with Worms, and fasten them on the Banksides: Let the Bait lie in the Stream on the ground all night, and you will have almost on every hook an Eel, so that you be there at day-break in the morning to take them; for as soon as day-light appears they will unhook themselves, though it be to the tearing in pieces their own intrails. You must be sure that your Hooks be strong, and your Lines may be of good, fine and strong handle-bound Pack-thread.

By Snigling.

Eels commonly abscond themselves under stones in stony Waters, and under Timber, Planks, or such-like, about Mills, Wears, Flood-gates, Bridges, &c. in the day time, where you may take them by this way of *Snigling*; that is, by baiting a strong Hook on a short but strong Line, with a large Garden-worm: Then with a stick cleft at the top, fasten therein the Line near the Hook, and guide the stick into the places where you think the Eels are, and thrust it up and down, and you shall be sure, if any Eel be there, as soon as she feels the stick, she will turn and bite; but be sure you pull not too hard lest you tear out your hold.

By Bobbing.

There is a way of taking *Eels* by bobbing; which is thus: Take of the large Garden-worms well scoured, and with a Needle run some strong twisted Silk through them from end to end, and wrap them oftentimes about a board; then tye them together with the ends of the Silk, that they may hang in hanks, and fasten them at the end of a small Cord, with a Plummot of Lead, about three quarters of a pound, a little above the Bob: The other end of the Cord fasten to a long Pole, and therewith may you Fish in muddy Water after a Rain. When you perceive by moving of your Bob, that the Eeles do tug at it, then gently raise them to the Surface of the Water, and so bring them to Land; for the Eels being greedy of the Worms, swallow them, and the Silk hangs in their Teeth, that they are easily taken, five or six at a time. Some make up a bundle of new Hay and Worms together, and so let it down into the Water; which the Eeles readily come to, and thrust their heads into the Hay after the Worms, and by that means are taken. Other stake a round Net made fast to a small Iron-hoop, and let it down into the Water, with a bundle

of

of Worms in the midst; which when the Eels come unto, by a sudden raising the Hoop, are taken in the Net: for in some gravelly Tide-waters, Eels, especially the small Grigs, will seek abroad in the day-time, and give you excellent sport.

S E C T. VI.

Of Angling for the Barbel, Grailing, Umber, Chevin and Chub.

These Fish are not so universal as the other before discoursed of; there-^{Barbel.} fore the less shall be said of them. As for the *Barbel*, it is a Fish very plentiful in the *Trent*, and comes in season about the end of *May*, and so holds it till near *Michaelmas*, and hath his haunts amongst weedy and hollow places, amongst Piles and Stakes; is a strong Fish, and must be taken with very strong Tackling: His Bait is a very well scoured Worm, Gentles, or Cheese steeped in Honey.

The *Grailing* and *Umber* are near alike; they are in season all the Sum-^{Grailing and Umber.} mer, and are then taken with a large Grasshopper, (the wings being taken off) After the Grasshopper is on the Hook, at the point put on a small Cadworm, and keep your Bait in continual motion: Let the Hook be shank'd with Lead, and covered with the Bait.

The *Umber* is taken with a Fly, as is a *Trout*.

The *Chevin* and *Chub* are common in the *Trent*, but no very pleasant^{Chevin and Chub.} Fish: They are in season all the Summer, and are taken with Worms, Flies, Snails, Cherries, Grasshoppers, Grain, Cheese, &c.

There are many other sorts of small Fish, as the *Bleak*, *Flounder*, *Gudge*,^{Small Fish,} *on*, *Ruff*, *Minnow*, *Loach*, and *Bullhead*: The ways of taking them, for brevity sake I shall omit.

In the *Isle of Wight*, and other places Westward, in the Rocks on the Sea-shore, are great numbers of *Cormorants* bred, being a large Fowl,^{Cormorant Fishing.} and live only by preying on Fish; and are so dextrous at it, that in the open Seas they will dive, and swiftly pursue their Game, and take and carry them to their Nests; that the Inhabitants near adjacent do often go to these Rocks, and furnish themselves with Fish brought thither by them at their breeding-times. These Birds may be so brought up tame, that they will in our ordinary clear Rivers dive, and take you as many *Trouts* or other Fish, as you please, or the place affords, putting but a small Collar over the Neck of the Fowl that the Fish may not pass into her Stomock. When you intend for your Game, you must carry her out Fasting: put on her Loop or Collar, and let her go into the Water, she will Dive, and straightly pursue the Fish she hath most mind to, forward and backward; and when she hath caught her Game, she gives it a toss into the Air, and receives it end-wise into her Mouth; which will stretch like the Head of a Snake, and admit of a large Fish into her Throat, which will stop at the Collar. Then hold out an Eel to her (which you must carry alive or dead with you to that purpose) and she will come to your hand, and will by your assistance disgorge her prey immediately, and to her sport again; and will so continue, till she hath furnished you with as much as you can desire. By this means may you take more than any other way whatsoever, and exceeds any of the Sports of Hawking or Hunting.

S E C T. VII.

Of Fish-ponds.

Of Carp ponds.

It is no small Improvement to watry-Lands that are not kind for Grass or Corn, to convert them into Fish-ponds; the dead, heavy, and more gross Waters are most proper for Carps, Tenches, Breams, &c. Carps especially will raise a considerable improvement, being a Fish that seldom wants a Market.

Those Ponds that stand near the Sea, and whose water is a little brackish, yield the best and fattest Carps; therefore it would not be amiss to cast into your Fish-ponds, through which there is but little current, sometimes a Load or more of the refuse Salt Earth, that at the Salternes is cast out and of no value. This may as well improve these Fish as the naturally brackish Water, and as well as Salt doth Pigeons, &c.

Trout-ponds.

Trout-Ponds if they are made at the very head of a Chaulky Spring, that the Trouts may feed at the very Atoms of Chaulk that issue out of the Rocks with the Water, are a great improvement to these Fish; but if the Water run far, it suffereth its Atoms to precipitate, and doth not improve the Trout to that degree of Redness and speedy growth, as otherwise it would do; some feed them with Flesh, &c. but it is not so good as the natural Food.

Oyster-ponds.

Those that live near the Sea-side may make a very considerable advantage of Pools for the fatning of Oysters, preserving of Lobsters, &c.

Kalen-

Kalendarium Rusticum:

OR,

MONTHLY DIRECTIONS

FOR THE

HUSBANDMAN.

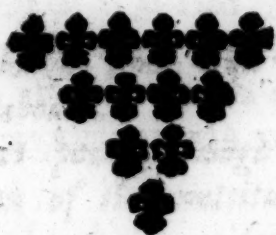
Being CHAP. XIII.

SHEWING

The most SEASONABLE TIMES for the performing
OF HIS

RURAL AFFAIRS
Throughout the Year.

*Operum memor esto tempestivorum
Omnium ——— Hesiod.*



LONDON,

Printed for Thomas Dring, at the Harrow over against
the Inner Temple-Gate in Fleetstreet. 1687.

Kalendarium Rusticum:

OR

MONTHLY DIRECTIONS

FOR THE

RUSSIAN.

Being CHAP. XIII.

SHOWING

The most SEASONABLE TIMES for the performing

OF HIS

RURAL AFFAIRS

Throughout the Year.

Optimus innoxio tempore
Hæc.



LONDON,

Printed for Thomas Diney, at the Harpers over against
the Inner Temple-Gate in Fleetstreet. 1687.

THE
PREFACE
TO THE
KALENDAR.

RUri, sicuti in Urbe, singula opera sua habent peculiara tempora: There is a peculiar time for most Affairs in the World, but more especially for such Labours and Actions that depend upon the mutable Seasons of the Year; which being duly observed, is no small advantage to the Husbandman. Ephemeridem habeat quid quoque tempore faciendum, is Florentines advice; that every Countryman may have his Draught before him to direct him, and reinforce his memory, that his multitude of occasions may not so far obliterate those things to his loss and disadvantage, but that he may here daily revive and renew his necessary intentions, and take time by the fore-look: as Pliny observed, Frontem Domini plus prodesse quam occiput; for Time is a thing so precious, and Occasion so precipitous; and where many things are to be done, Time let pass, prevents the success of our endeavours, and loss and confusion succeeds; Semper autem dilator operum vir cum damnis inestatur: It is a very great neglect in Agriculture to be too late, it brings a considerable damage; like a backward year that produces a bad Crop, so doth a backward Husbandman meet with small gains. You very rarely find a thriving Husbandman behind with his Affairs, or a declining Husband so forward as his Neighbour.

Nudus serito, nudusque arato,
Nudus quoque metito, si quidem tempestiva omnia voles,
Opera ferre Cereris: ut tibi singula
Tempestiva crecant, ne quando interim egens,
Mendices ad alienas domos, nihilque efficias.

It was Hesiod's advice, to Plough, Sow, and Reap in good time, if you expect a plentiful reward of your Labour.

But if it be not in every ones power, though he know the Seasons for all things, to observe them, by reason of the multitude and variousness of business that flows upon the laborious Husbandman, at some certain times of the year more than at other, many casualties also intervening; to such it is advised that they make use of the next opportunity convenient, to do what before they have omitted: Yet Cato tells you, Res Rustica sic est, si unum sero feceris, omnia opera sero facies; neglect one, neglect all.

There are two sorts of Times and Seasons prescribed by the Ancients to be observed in Agriculture, viz. of the Year, being, only of the motion of the Sun through the Twelve Signs of the Zodiack, which begets the different Seasons and Temperatures of the Spring, Summer, Autumn, and Winter; and of the Aspects and state of the Moon, and rising and setting of the Stars: whereof, and also of several Prognosticks of the mutability, state and condition
of

of the several Seasons, and their Natural Inclinations, I shall take notice in this ensuing Kalendar, and give you at the end of it a Breviat of such Observations as I have found in several Ancient and Modern Authors treating of that Subject.

They should besides their Observations make
From Northern Stars, the Skies, and Silver Snake,
Like those homeward through swoln Billows trade,
And Oyfter-breeding *Hellepont* invade.

Virgil.

The use of this part of *Astrology* hath been by Pliny and other Ancients esteemed as necessary to be observed and understood by the Farmer as by the Saylor.

As for the Times and Seasons of the Year, from the beginning to the end thereof, every day something is to be done by the Husbandman; as was said of a Gardiner, that his work is never at an end, it begins with the Year, and continues to the next: *Annus in opere Rustico absolutus est*: yet is it not every year alike, neither is every place alike; some years, or at least some Seasons of the year, prove more forward by two or three Weeks, or more, at one time than at another: Also the situation of places, either better defended from, or more obvious to the intemperature of the Air, begets some alterations. In these, and such like Cases, the subsequent Rules are to be seasonably applied by the Judicious Husbandman, according as the Season happens to be earlier or later, or the different situation of places requires.

This Method in general is the same that hath been used by the most Ancient that (I have understood) to have written of Agriculture; and also our Moderns, as you may observe in Hesiod, Columella, Palladius de Serres, Augustino, Gallo, Tusser, Markham, Stevenson, and others; and last of all Mr. Evelyn his excellent *Kalendarium Hortense*, at the end of his *Sylva*.

I shall endeavour herein to be as brief as I can; I shall add nothing more than what is necessary, and shall leave out such things that are but little to our purpose, and shall begin with the major part of our Presidents in the like case: although the year, in respect of the Sun's entrance into Aries, and the Commencement of the date of the year, begins in March; yet Tusser declines both, and begins at Michaelmas, it being the usual time for the Farmer to enter on his Farm, the ground being then more easily cleared of its former stock, than at any other time. But seeing that it is no very material thing when we begin, our labour having no end, we will tread the most usual Path, decline both Extremes, and begin when our days do sensibly lengthen, our hopes revive of an approaching Summer, and our Almanacks give us a New-years day.

JANUARY.

JANUARY.

Day	Sun rise. h. m.	Sun set. h. m.
1	New-years-day.	
2		
3		
4	8 00	4 00
5		
6	Twelfth-tide.	
7		
8		
9		
10	Sun in Aqua.	
11		
12		
13		
14		
15		
16	7 45	4 15
17		
18		
19		
20		
21		
22	Vincent.	
23		
24	7 30	4 30
25	Paul's day.	
26		
27		
28		
29		
30	K. Charles his Martyrdom.	
31	7 15	4 45

Castor and Pollux rise in the evening.

Lucida Corona, or the Crown, is with the Sun.

The Dog-star riseth in the Evening.

Mensis difficillimus hic Hybernus; difficilis oribus, difficilisque hominibus.

THis Month is the rich mans charge, and the poor mans misery; the cold like the days increase, yet qualified with the hopes and expectations of the approaching Spring: The Trees, Meadows and Fields are now naked, unless cloathed in white, whilest the Countryman sits at home, and enjoys the Fruit of his past Labours, and Contemplates on his intended Enterprises. Now is welcome a cup of good Cider, or other excellent Liquors, such that you prepared the *Autumn* before; moderately taken, it proves the best Physick.

A cold *January* is reasonable: Plough up or fallow the Ground you intend for Pease: Water Meadows and Pastures: Drain Arable grounds where you intend to sow Pease, Oats or Barly: rear Calves, Pigs, &c.

JANUARY.

Lay Dung on heaps, carry it on the Land in frosty Weather; on Pasture-land hedge and ditch.

Plant Timber-trees, or any Coppice-wood, or Hedge-wood; and also Quick-sets: cut Coppices and Hedge-rows; lop and prune greater Trees.

Feed Doves, and repair Dove-houses; cut away Ant-hills, and fill up the holes in Meadow and Pasture-grounds; gather stones, &c. have special care to Ews and Lambs; house Calves; Geld young Cattle soon after they are fallen: sow Oats, if you will have of the best, says old Tusser.

Ores.

**In Janivere Husband that peneheth the Grotes,
will break up his Lay, or be sowing of Otes.
Otes sown in Janivere, lay by the Wheat;
In May buy the hay for Cattle to eat.**

Garden and Orchard.

Plant Vines, and other Fruit-trees, if the weather be open and mild; dig and trench Gardens, or other ground for Pease, Beans, &c. against the Spring: Dig Borders, uncover roots of Trees where need is, and add such Manure to them as they require: you may also, if the weather prove mild, set Beans and Pease. As yet Roses may be cut and removed.

Prune Orchard-fruits and Vines, so that it be not frosty; nail and trim Wall-fruits; cleanse Trees of Moss in moist weather.

Gather Cions for Graffs, and stick them in the ground; for they will take the better, being kept some time from the Tree; and at the latter end, if the weather be mild, you may begin to Graff.

Make your Hot-bed, and sow therein your choice Sallads; sow Col-leflowers; secure your choice Plants and Flowers from the injury of the weather, by Covers, by Straw, or Dung: Earth up the roots of such Plants the Frosts have uncovered.

Set Tarps to destroy Vermine, where you have or sow such Plants or Seeds as they injure.

Take Fowl, destroy Sparrows in Barns, and near them; kill the Opes or Bull-finches that Feed on the Buds of Fruit-trees.

Hop-garden.

Dig a Weedy Hop-garden.

Apiary.

Turn up your Bee-hives, and sprinkle them with warm and sweet Wort dexterously. Also you may remove Bees.

FEBRUARY.

FEBRUARY.

Day	Sun rise. h. m.	Sun set. h. m.	
1			
2			Candlemas.
3			Cor Leonis riseth in the Evening.
4			
5			
6			
7			
8	7 00	5 00	Sun in Pisces.
9			
10			
11			
12			
13			
14			Palentine.
15			
16	6 45	5 15	Cor Hydra riseth in the Evening.
17			The Tail of the Lion riseth in the Evening.
18			
19			Flomabur is with the Sun.
20			
21			
22			
23	6 30	6 30	
24			Matthias.
25			
26			
27			
28			

Ut sementem feceris, ita & metes.

THis is a principal Seed-month for such they usully call *Lenten-Grain*. This Month is usually subject to much Rain or Snow: if it prove either, it is not to be accounted unseasonable; the Proverb being, *February fill Ditch, with either black or white.*

Now sow all sorts of Grey-pease, Fitches, Beans and Oats: Carry out Dung, and spread it before the Plough, and also on Pasture-ground; this being the Principal Moneth for that purpose.

Plant Quick-seeds newly raised; the Spring being so near, they will not keep long.

Set Willow-plants, or Pitchers; and also Poplars, Osiers, and other Aquaticks.

Sow Mustard-seed and Hemp-seed, if the Spring prove mild; feed your Swans, and make their Nests where the Floods reach them not.

Soil Meadows that you cannot overflow or water; catch Moles, and level Mole-hills.

FEBRUARY.

Also this is the only time for plashing of Quick-sets, and a very good season for the shrouding or lopping of Trees, or cutting Coppices.

Garden and Orchard.

You may yet prune and trim Fruit-trees, and cleanse them from Moss and Cankers. Now is a very good time for grafting the more forward sort of Fruit-trees, if the weather be temperate.

Your tender Wall-fruit cut not till you think the hard Frosts are over.

Plant Vines, or any sorts of Fruit-trees in open weather: trim up your Pallisade hedges and Espaliers: set Kernels, Nuts, or stones of Fruit, and other hard seeds.

Lay branches to take root, or place Baskets, &c. of Earth for the branches to pass through.

Sow Annise, Beans, Pease, Raddish, Parsnips, Carrots, Onions, Parsley, Spinage, and other hardy Herbs or Seeds, and plant Cabbage plants: plant out Collesflowers into warm places: Also plant Liquorice. Yet you may destroy Sparrows. Now is the time the Bull-finch doth the greatest harm to the buds of Fruit-trees.

Make up your Hot-beds for Melons, Cucumbers, &c. Sow Asparagus. Continue Vermine-traps, and pick up all the Snails you can find, and destroy Frogs and their Spawn.

A good time to sew Fish-ponds, and take Fish; the most Fish being now in season.

Hop-Garden.

Now you may, if the weather prove milde, plant Hops, and dress them that are out of heart.

Apiary.

Half open your passages for Bees; and now may yet remove them.

MARCH.

MARCH.

Day	Sun rise. h. m.	Sun set. h. m.	
1			About the end of this Month you may begin to sow
2	David.		Clay than in Sand. You may now sow Wheat if the weather prove dry: make an end of sowing all sorts of Pulse. You may now sow
3	6 15	5 45	or lop old Trees, and Felt Coppice-wood better than at any other
4			son in the Year.
5			This is the only time for raising the best brood of Poultry.
6			It is a good time to set Others, Willows, or other Aquatics: low
7			Rye called March-Rye.
8			In this Month, and the next, you may sow all sorts of French-Grass
9			or new Hays; as Clover, St. Roy, &c. Also now low Hemp and Fl
10	6 00	6 00	If the weather be temperate
11			The principal time of the year for raising all sorts of P
12			Sow any former
13			This is the principal Month in the year for raising all sorts of P
14			trees. Now cover the roots of all such Trees you laid bare in the W
15			ter preceding, and remove such young Trees you omitted to remove
16			the better Season.
17			Carry Dung into your Gardens, Orchards, &c.
18	5 45	6 15	Turn your Fruit in the Room where it lies, but open not yet the
19			grows.
20			You may now transplant such sorts of Golden Rods, Sweet Herb
21			and Summer-flowers; make the best use of
22			from all may now be sown, and
23			Now sow Rye, &c.
24			Farley, Sorrel, Burdock, Horrag, Chervil, Yeller, &c.
25	5 30	6 30	ders, &c. Also Leice, Onions, Garlic, &c.
26			Carrots, Cabbages, Celler, Fennel, &c.
27			made, Marigolds, &c.
28			Dress up and string your Strawberry-bed; uncover
29			and transplant Asparagus; slip and plant Arisotokes and Liguorice
30			Stand and bind up the weakest Plants against the wind; low
31			Carrots, &c. in the left wing of
			the evening.

Titan doth by his presence now reweave
Things Sensible, as well as Vegetative.

The beginning of *March* usually concludes the nipping Winter, the end initiates the subsequent welcome Spring according to the Proverb, *March cometh in like a Lyon, and goes out like a Lamb*. If it prove cold, it is seasonable to check the pregnant Buds, and forbid them till a more safe and opportune season near approaching. If this Month prove dry, the Countryman counts it Ominous of a happy Year for Corn.

March Dust to be sold,
Worth Ransome of Gold.

Tuffer.

Let Cattle no longer feed on Meadows nor Marshes you intend to Mow: have special regard to the Fences, both of Meadow and Corn.

About

M A R C H.

About the end of this Month you may begin to sow Barly, earlier in Clay than in Sand. You may now rowl Wheat, if the weather prove dry: make an end of sowing all sorts of Pulse. You may now shroud or lop old Trees, and Fell Coppice-wood better than at any other Season in the Year.

This is the only time for the raising the best brood of Poultry.

It is a good time to set Osiers, Willows, or other Aquaticks: sow the Rye called *March-Rye*.

In this Month, and the next, you may sow all sorts of French-Grasses, or new Hays; as Clover, St. Foyn, &c. Also now sow Hemp and Flax, if the weather be temperate.

The principal time of the year for the destruction of Moles.

Sow any sort of white Pease, or Hattings.

Garden and Orchard.

This is the principal Month in the year for grafting all sorts of Fruit-trees. Now cover the roots of all such Trees you laid bare in the Winter preceding, and remove such young Trees you omitted to remove in the better Season.

Carry Dung into your Gardens, Orchards, &c.

Turn your Fruit in the Room where it lies, but open not yet the Windows.

You may now transplant most sorts of Garden-herbs, Sweet-herbs, and Summer-flowers; make Hot-beds for Cucumbers, Melons, &c. Saffron also may now be planted, and Madder.

Now sow Endive, Succory, Leeks, Radish, Beats, Parsnips, Skirrets, Parsley, Sorrel, Burgloss, Borrage, Chervil, Sallery, Smallage, Allisanders, &c. Also Lettice, Onions, Garlick, Orach, Purflain, Turneps, Pease, Carrots, Cabbage, Cresses, Fennel, Majorom, Basil, Tobacco, Leeks, Spinage, Marigolds, &c.

Dress up and string your Strawberry-beds; uncover *Asparagus-Beds*, and transplant *Asparagus*; slip and plant Artichokes and Liguorice.

Stake and bind up the weakest Plants against the winds: sow Pinks, Carnations, &c. In this month sow Pine-kernels, and the Seeds of all Winter-greens.

Plant all Garden-herbs and Flowers that have fibrous Roots.

Sow choice Flowers that are not natural for our Climate in Hot-beds this Month.

Hop-garden.

You may now plant Hops; it is a very seasonable time to dress them.

Apiary.

Now the Bees sit, keep them close night and morning, if the weather prove ill. You may yet remove Bees.

APRIL

APRIL

Day	Sun rise. h. m.	Sun set. h. m.
1		
2	5 15	6 45
3		
4		
5		
6		
7		
8		
9	5 00	7 00
10	Sun in Taur.	
11		
12		
13		
14		
15		
16		
17	4 45	7 15
18		
19		
20		
21		
22		
23	St. George.	
24		
25	Mark Evang.	
26	4 30	7 30
27		
28		
29		
30		

Cauda Leonis sets in the morning.

Vergilia, or Pleiades, rise with the Sun.

Dilucula surgere saluberrimum est.

THe Mornings now seem pleasant, the Days long. The Nymphs of the Woods in Confort welcome in Aurora.

Hail April, true Medea of the Tear,
That makest all things young and fresh appear:
When we despair, thy seasonable Showers
Comfort the Corn, and cheer the drooping Flowers.

A dry Season to sow Barley in is best, to prevent Weeds. If April prove dry, Fallowing is good.

Fell the Timber you intend to barque; if the Spring be forward, cleanse and rid the Coppices, and preserve them from Cattle: keep Geese and

A P R I L.

and Swine out of Commons or Pastures.

Pick up Stones in the new-sown Land ; sow Hemp and Flax.

Cleanse Ditches, and get in your Manure that lies in the Streets or Lanes, or lay it on heaps.

Set Osiers, Willows, and other Aquaticks, before they are too forwards.

You may throughout this Month sow Clover-grass, St. Foyn, and all French or other Grasses or Hays.

Garden and Orchard.

YOU may yet Graff some sorts of Fruit in the Stock the beginning of this Month.

Now sow all sorts of Gardens-seeds in dry weather, and plant all sorts of Garden-herbs in wet weather.

Plant French-beans, Cucumbers, Melons, Artichokes and Madder, and sow such tender Seeds that could not abide the harder Frosts ; set French-beans.

Gather up Worms and Snails after evening Showers, or early in the morning.

Sow your Annual Flowers that come of Seed, that you may have Flowers all the Summer : and transplant such Flowers with fibrous Roots you left unremoved in *March* : sow also the Seeds of Winter-greens.

Now bring forth your tender Plants you preserved in your *Conservatory*, except the Orange-tree, which may remain till *May*.

Transplant and remove your tender Shrubs ; as Jasmines, Myrtles, Oleanders, &c. Toward the end of this Month also in mild weather, clip Phillyrea, and other tansie Shrubs, and transplant any sort of Winter-greens.

Hop-garden.

Plant Hops, and pole them in the beginning of *April*, and bind them to the Poles.

Apiary.

Open the doors of the Bee-hives, for now they hatch, that they may reap the benefit of the Flowry Spring ; and be carefull of them.

M A Y.

M A Y.

Day	Sun rise. h. m.	Sun set. h. m.	
1	Phil. & Jac.		
2			Cor Scorpionis sets in the Morning.
3			The greater Dog-Star sets in the Evening.
4			
5			
6	4 15	7 45	
7			
8			The Goat-Star appears.
9			
10			Aldebran sets in the Evening.
11	Sun in Gem.		Fomalhaut riseth in the Morning.
12			
13			Middle Star of Andromeda's Girdle sets with
14			the Sun.
15			
16	4 00	8 00	
17			
18			
19			
20			
21			Cor Scorpionis riseth in the Evening.
22			
23			
24			
25			
26	5 30	8 10	
27			The Bulls Eye riseth with the Sun.
28			
29	K.C. his Return.		
30			
31			

Cuculus canit, quercus in frondibus
Delectantque mortales in immensa terra.

THis Month ushers in the most welcom season of the Year. Now gentle Zephyrus fans the sweet Buds: and the Cœlestial drops water fair Flora's Garden.

The lofty Mountains standing on a row,
Which but of late were Perrivigg'd with Snow,
D'off their old Coats, and now are daily seen
To stand on tip-toes all in swaggering green.
Meadows and Gardens are pranckt up with Buds.
And Chirping Birds now Chant it in the Woods:
The Warbling Swallow, and the Larks do sing,
To welcom in the Glorious Verdant Spring.

M m

The

MAY.

The Countrymans heart is revived (if this Month prove seasonable) with the hopes of a happy *Autumn*; if it prove cold, it is an Omen of good for health, and promises fair for a full Barn: the pleasure of Angling is now in its splendor, especially for the Trout and Salmon.

Now ~~wean~~ those Lambs you intend to have the Milk of their Ewes; forbear cutting or cropping Trees you intend shall thrive till *October*; kill Ivy.

If your Corn be too rank, now you may Mow it, or feed it with Sheep before it be too forward; weed Corn. In some places Barley may be sown in this Month.

Now sow Buck-Wheat or Brank; sow latter Pease. Also Hemp and Flax may yet be sown.

Weed Quicksets; drain Fens and wet Grounds; Twifallow your Land; carry out Soyl or Compost; gather stones from the Fallows; turn out the Cattle to Grass, overcharge not your Pastures, lest the Summer prove dry; get home your Fewel; begin to burn-beat your Land; stub or root out Goss, Furze, Broom, or Fern; and grub up such Coppices, or other shrubby woody places you intend should not grow again.

Sell off your Winter-fed Cattle.

About the end of this Month mow Clover-grass, St. Foyn, and other French-grasses. Now leave off watering your Meadows, lest you gravel or rot your Grass.

Look now after your Sheep, if this Month prove Rainy, lest the Rot surprize them.

Garden and Orchard.

Plant all sorts of Winter-greens.

Sow the more tender Garden-Seeds; as Sweet-Marjerom, Basil, Thyme, and hot Aromatick Herbs and Plants: set Sage and Rosemary.

Cover no longer your Cucumbers, Melons, &c. excepting with Glasses: sow Purslain, Lettice, &c.

About the end of this Month, take up such Tulips which are dried in the stalk.

Hop-Garden.
Apiary.

Bind Hops to their Poles, and make up the Hills after Rain.

Watch the Bees now ready to swarm.

JUNE.

JUNE

Day	Sun rise. h. m.	Sun set. h. m.
1		
2		
3		
4	3 45	8 15
5		
6		
7		
8		
9		
10	3 43	8 17
11	Barnabas.	
12		
13		
14		
15		
16		
17		
18		
19		
20	3 45	8 15
21		
22		
23		
24	John Baptist.	
25		
26		
27		
28		
29	Peter Apostle.	
30	3 50	8 10

The Head of *Castor* riseth in the Morning
before the Sun.
Sun in *Cancer*, Solstice.

Arcturus sets in the Morning.

Hydra's Heart sets in the Evening.

The Right foot of *Gemini* sets in the Morning.

Humida Solstitia atque Hyemes Orate Serenas Agricola.

A Showr at this time of the year is generally welcome : now *Phæbus* ascends the utmost limits of the *Zodiac* towards the *Pole-Artick*, and illuminates our most Northern Climes ; and makes those Countries that within a few Months seemed to be wholly bereft of pleasure, now to resemble a *Terrestrial Paradise* ; and gives unto them the full proportion of his Presence, which in the Winter past was withdrawn, that they partake equally of his light with the more Southern Countries. The glorious Sun glads the Spirit of Nature, and the sweet showers now refresh the thirsty Earth : The Grain and Fruits now shew themselves to the joy of the Husbandman : The Trees are all in their rich array, and the Earth it self laden with the Countrymans Wealth ; if the Weather be calm, it makes the Farmer smile on his hopefull Crop.

J U N E.

This Month is the prime season for the washing and shearing of Sheep; in forward meadows mow Grass for Hay.

Cast Mud out of Ditches, Pools or Rivers: This is the best time to raise Swine for Breeders.

Fallow your Wheat-land in hot weather; it kills the Weeds. *Arati-ones eo fructuosiores sunt, quo calidior terra aratur, haque inter Solstitium & caniculum absolvenda, saith Varro.*

Carry Marl, Lime, and Manure of what kind soever, to your Land; bring home your Coals, and other necessary fuel fetcht far off, before the Teams are busied at the Hay-Harvest.

Weed Corn, sow Rape and Coal-seed, and also Turnep-seed. Now Mildews or Honey-dews begin to fall.

Mind your Sheep as we advised you in May.

Garden and Orchard.

Now begin to Inoculate: beware of cutting Trees, other than the young shoots of this year: pluck off Buds, where you are not willing they should branch forth.

Water the latter Planted Trees, and lay moist Weeds, &c. at the roots of them.

It is a seasonable time to distill Aromatick and Medicinal Herbs, Flowers, &c. and to dry them in the shade for the Winter: Also to make Syrups, &c.

Gather Snails, Worms, &c. and destroy Ants and other Vermine.

Set Saffron, plant Rosemary and Gilly-flowers; sow Lettice, and other Sallets, for latter Saletting.

Gather Seeds that are ripe, and preserve them that are cool and dry: Water the dry Beds; take up your bulbous roots of Tulips, Anemonies, &c.

Inoculate Jasmines, Roses, &c. Also transplant any sort of bulbous roots that keep not well out of the ground. Now plant slips of Myrtle, Sow latter Pease.

Hop-Garden.

Dig Ground where you intend a Hop-Garden, and bind such Hops to the Poles the wind hath shaken off.

Apiary.

Bees now swarm plentifully; therefore be very vigilant over them, they will require your care.

J U L Y.

JULY

Day	Sun rise. h. m.	Sun set. h. m.	
1			First Star of Orion riseth with the Sun
2			Visit. of Mary.
3			
4			
5			
6			
7			
8	4 00	8 00	
9			
10			
11			
12			Lacina Corona riseth in the Evening.
13			Sun in Leo.
14			
15			Swithen.
16			
17			
18	4 15	7 45	
19			Dog-Days beg.
20			Margaret.
21			
22			Mary Magd.
23			
24			
25			James Apost.
26			
27	4 30	7 30	
28			
29			
30			Greater Dog-Star riseth with the Sun.
31			Syrius riseth in the Morning.

*Tempore Messis, quando sal corpus efficitur.
Tunc festina, & domum fruges Congrega
Diluculo surgens.*

IN thirsty July would the parched Earth be glad of a moistning shower to refresh and receive the scorched Vegetable. Now is there an equal care taken to avoid Phæbus his bright and burning Beams, as in the Winter the furious blasts of Boreas. Tempests now much injure the laden Fruit-trees and standing Corn, to the great detriment of the Husbandman.

Now is the Universal time for Hay-making; loose not a good opportunity, especially if fair weather be scarce.

Mow your Head-Lands; and Fallow where the Land requires it: gather the Fimble, or earliost Hemp and Flax.

At the latter end of this Month, Corn-Harvest begins in most places in a forward year.

Still

JULY

Still carry forth Marl, Lime, and other Manure: bring home Timber and Jewel, and other heavy materials.
Wheat and Hops are now subject to much damage by Mildews.
Sow Turnep seed in this Month.

Garden and Orchard.

IT is a principal time for the Inoculation of choice Fruits, Roses, &c. And for the Summer-pruning of your Wall-Trees for the making of Cherry-Wine, Raspberry-Wine, &c.

Cut off the stocks of such Flowers that have done Blossoming, and cover their roots with new fat Earth.

Sow Sallet-herbs for the latter Salletting; and also Pease.

Take away the Snails from your Mural-Trees.

Slip Stocks, and other lignous Plants and Flowers, and lay Gilliflowers and Carnations for encrease, watering them, and shadowing them from the fervent Sun-beams. Lay also Myrtles, and other curious Greens: clip Box, and other Tonfile Plants.

Graft my approach, and inoculate Jasmines, Oranges, &c.

Transplant or remove Tulips, or other bulbous roots: some may be kept out of the Ground, others immediately planted.

Hop-Garden.

If the Season be very dry, the watering of the Hops will very much advantage them, and make them the more fruitfull: if it prove moist, renew and cover the Hill still with fresh Mould.

Apiary.

Now Bees cast their latter swarms, which are of little advantage; therefore its best to prevent them.

Streighten the entrance of your Bees: Kill the Drones, Wasps, Flies, &c.

AUGUST

AUGUST.

Day	Sun rise. h. m.	Sun set. h. m.	
1			Lammas.
2			Orion appears in the Morning.
3			
4			
5			
6	4 45	7 15	
7			
8			Cor Leonis riseth in the morning with the Sun.
9			
10			Laurence.
11			
12			
13	5 00	7 00	Sun in Virgo.
14			
15			
16			
17			
18			
19			
20			
21	3 15	6 45	
22			Canda Leonis riseth in the morning with the Sun.
23			
24			Bartholomew.
25			
26			
27			Dog-Days end.
28	5 30	6 30	
29			
30			

Non semper aestas erit fasite Nidos.

NOW bright *Phæbus*, after he hath warmed our *Northern Hemisphere*, retires nimbly towards the *Southern*; and the fresh Gales of *Zephyrus* begin to refigate the scorching Sun-beams: the Earth now yields to the patient Husbandman the fruits of his labours. This Month returns the Country-mans expenses into his Coffers with increase, and encourages him to another years adventure. If this Month prove dry, warm, and free from high winds, it rejoyceth the Country-mans heart, encreaseth his gains, and abates a great part of his Disbursements.

You may yet Thryfallow: Also lay on your Compost or Soyl, as well on your Barley-Land, as Wheat-Land.

Carry Wood or other Fewel home before the Winter.

Provide good Seed, and well picked against Seed-time.

Put your Ewes and Cows, you like not, to fatting.

This

AUGUST.

This is the most principal Harvest Month for most sorts of Grain; therefore make use of good weather whilst you have it.

About the end of this Month you may Mow your after-grass; and also Clover, St. Foyn, and other French Hays or Grasses.
Geld Lambs.

Garden and Orchard.

This is a very good time for Inoculation in the former part of this Month.

You may now make Cider of Summer-Fruits; prune away superfluous Branches from your Wall-fruit-Trees, but leave not the Fruit bare, except the red Nectarine, which is much meliorated and beautified by lying open to the Sun.

Pull up Suckers from the Roots of Trees; unbind the Buds you Inoculated a Month before, if taken.

Plant Saffron, set slips of Gilliflowers, sow Annise. Now is beginning a second season for the encreasing and transplanting most Flowers, and other Garden-Plants; as Herbs, Strawberries, &c.

The Seeds of Flowers and Herbs are now to be gathered: Also gather Onions, Garlick, &c.

Sow Cabbages, Colle-Flowers, Turneps, and other Plants, Roots, and Herbs for the Winter, and against the Spring.

Now sow Larks-heels, Canditufts, Columbines, &c. and such Plants as will endure the Winter.

You may yet slip Gilliflowers, and transplant bulbous Roots about Bartholomew-tide: some esteem the only secure season for removing your Perennial or Winter-greens; as Phyllirea's, Myrtles, &c. It is also the best time to plant Strawberries, and it is not amiss to dress Rose-trees, and plant them about this time.

Hop-Garden.

Prop up those Poles the Wind blows down: Also near the end of the Month gather Hops.

Apiary.

Towards the end of this Month take Bees, unless the goodness of the weather provoke you to stay till the middle of the next: destroy Wasps and other Insects, and streighten the passages to secure them from Robbers.

SEPTEMBER.

S E P T E M B E R.

Day	Sun rise. h. m.	Sun set. h. m.
1	Giles.	
2		
3		
4		
5		
6	5 45	6 15
7	Nat. of Mary.	
8		
9		
10		
11		
12		
13	6 00	6 00
14	Holy Cross.	
15		
16		
17		
18		
19		
20	6 15	5 45
21	Matthew Ap.	
22		
23		
24		
25		
26		
27	6 30	5 30
28	Michael Ark.	
29		
30		

Arcturus setteth after the Sun.

Sun in Libra, Equinoctial.

Spica Virginis is with the Sun.

Pleiades rise in the Evening.

IT is now the *Equinoctial*, that bids adieu to the pleasant Summer past, and summons us to prepare for the approaching Winter: the beauty and lustre of the Earth is generally decaying; our Countrymen and Ladies do now lament the loss of those beautifull objects, *Ceres*, *Flora*, and *Pomona*, in their Fields, Gardens and Orchards, so lately presented them withall; but that their minds and hands are busied in preparing for another return, in hopes of a better Crop. Gentle showers now glad the Plowmans heart, make the Earth mellow, and better prepare it for the Wheat, which delights in a moist Receptacle: still weather, and dry, is most seasonable for the fruits yet on the Trees. The Salmon and Trout, in most Rivers, go now out of season till *Christmas*.

This month is the most Universal time for the Farmer to take possession of his new Farm: get good Seed, and sow Wheat in the dirt, and Rye in the dust.

SEPTEMBER.

Amend the Fences about the new-sown Corn; share away Crows, Pigeons, &c.

Geld Rams, Bulls, &c. sew Ponds: Put Boars up in Sty.

Beat out Hemp-seed, and water Hemp; gather Mast, and put Swine into the Woods.

Carry home Brakes; saw Timber and Boards; Manure your Wheat-Lands before the Plough.

Garden and Orchard.

YOU may now make Cider and Perry of such Fruits as are not lasting, and gather most sorts of Winter-Pears, and some sorts of Winter-apples; but gather not long-lasting Fruit till after *Michaelmas*.

Sow Cabbages, Colicflowers, Turnips, Onions, &c. Now transplant Artichokes, and Asparagus roots, and Straw-berries, out of the Woods: plant forth your Cabbages and Colicflowers that were sown in *August*, and make thin the Turnips where they grow too thick.

Now plant your Tulips, and other bulbous Roots you formerly took up, or you may now remove them: you may also transplant all fibrous roots.

Now retire your choice Plants into the Conservatory, and shelter such Plants that are tender, and stand abroad.

Towards the end of this Month may you gather Saffron.

Hop-Garden.

Now finish the gathering and drying of your Hops; cleanse the Poles of the Hawn, and lay up the Poles for the next Spring.

Apiary.

Take Bees in time; streighten the entrance into the Hives; destroy Wasps, &c. Also you may now remove Bees.

OCTOBER.

OCTOBER.

Day	Sun rise. h. m.	Sun set. h. m.
1		
2		
3		
4	6 45	5 15
5		
6		
7		
8		
9		
10		
11		
12	7 00	5 00
13		
14	Sun in Scorpio.	
15		
16		
17		
18	Luke Evan.	
19		
20	7 15	4 45
21		
22		
23		
24	Crispine.	
25		
26		
27		
28	Sim. and Jud.	
29	7 30	4 30
30		
31		

Spica Virginis riseth in the Morning with the Sun.

Cauda Leonis sets in the Evening.

Phœbus withdraws his Lustre, and his Rays
He but obliquely on the Earth displays.

Now enters October, which many times gives us earnest of what we are to expect the Winter succeeding: that I may say,

The Sun declines, and now no comfort yields
Unto the fading Off Spring of the Fields.
The Tree is scarce adorn'd with one wan Leaf,
And Ceres dwells no longer at the Sheaf.

If it prove windy, as it usually doth, it finishes the Fall of the Leaf: and also shatters down the Mast and other Fruits, leaving neither Leaf nor Fruit.

OCTOBER.

Lay up Barley-Land as dry as you can: Seed-time yet continues, and especially for Wheat.

Well water, furrow, and drain the new-sown Corn-land: Now is a good time for sowing of Acorns or Nuts, or other sort of Mast or Berries for Timber. Coppice-wood, or Hedges.

Sow Pease in a fat and warm Land: you may plant Quick-sets, and all sorts of Trees for Ornament, or for use; and also plash Quick-sets.

Wean the Foals that were foaled of your draught-Mares at Spring: put off such Sheep as you have not Wintering for.

Follow Malting; this being a good time for that work.

Garden and Orchard.

Make Cider and Perry of Winter-fruits throughout this Month. Now is a very good time for the planting and removing of all sorts of Fruit-trees, or any other trees that shed their Leaf.

Trench the stiffer grounds for Orcharding and Gardening, to lie for a Winter mellowing. Now lay open the roots of old and unthriving Trees, or such that spend themselves too much, or too soon it blossoms.

Gather the residue of the Winter-fruits; also gather Saffron.

Sow all sorts of fruit-stones, Nuts, Kernels and Seeds, either for Trees, or Stocks.

Cut and prune Rose-Trees. Many of September-works may yet be done, if the Winter be not too forward.

Now plant your bulbous roots of all sorts, and continue planting and removing several Herbs and Flowers with fibrous roots, if the former and better season be omitted.

Hop-Garden;

This Month is the best time to plant Hops: And you may bag or pack those you dried the last Month.

Apiary.

Now you may safely remove Bees.

NOVEM.

NOVEMBER.

Day	Sun rise. h. m.	Sun set. h. m.	
1			<i>Allhollontide.</i>
2			
3			
4			
5			<i>Powder-Plot.</i>
6	7 45	4 15	<i>Leonard.</i>
7			
8			
9			
10			<i>Virgilie, or the Seven Stars set in the morning.</i>
11			<i>Martin-mas.</i>
12			<i>The Bulls Eye sets in the Morning.</i>
13			
14			
15			
16	8 00	4 00	<i>Edmund.</i>
17			
18			
19			
20			
21			
22			
23			<i>Cor Scorpii rise in the Morning.</i>
24			
25			<i>Last three bright Stars in the middle of</i>
26	8 10	3 50	<i>Scorpio rise in the Morning.</i>
27			<i>The Bulls Eye riseth in the morning.</i>
28			
29			<i>The middle Stars of Andromeda's Girdle</i>
30	<i>S. Andrew Ap.</i>		<i>riseth in the morning.</i>

Hyens Ignava Colono.

Virgil.

November generally proves a dirty Month, the Earth and Trees wholly unclothed. Sowing of Wheat or Rye upon a conclusion: the Country-man generally forsakes the Fields, and spends his time at the Barn, and at the Market. A good fire begins to be welcome.

Wheat may yet be sown on very warm and rich Lands, especially on burn-baited Land.

Fat Swine are now fit for slaughter: lessen your Stocks of Poultry and Swine.

Thrash not Wheat to keep untill *March*, lest it prove foisty.

Lay Straw, or other wast stuff in moist places, to rot for Dung: Also lay Dung on heaps.

Fell Coppice-woods, and plant all sorts of Timber, or other Trees: fell Trees for Mechanick uses; as Plough-boot, Cart-boot, &c.

Break Hemp and Flax.

Now

NOVEMBER.

Now may you begin to overflow or Drown your Meadows that are fed low.

Destroy Ant-hills.

Garden and Orchard.

Pease and Beans may now be set; some say Garlick: And trench or dig Gardens.

Remove and Plant Fruit-trees; furnish your Nursery with Stocks against the Spring.

Yet may you make Cider of hard fruits that are not pulpy.

Prune Trees; mingle your rich Compost with the Earth in your Orchards against the Spring.

Some very hard Fruits may yet be gathered.

Lay up Carrots, Parsnips, Cabbages, Colleflovers, &c. either for your use, or to transplant for seed at the Spring: cover the Asparagus-beds, Artichoaks, Straw-berries, and other tender Plants, with long Dung, Horse-Litter, Straw, or such like, to preserve them from the bitter Frosts, so dig up Liquorice.

Now is the best season to plant the fairest Tulips, if the weather prove not very bitter.

Cover with Mattresses, Boxes, Straw, &c. the tender Seedlings.

Plant Roses, Lilac, and several other Plants and Flowers, the weather being open.

As yet you may sow Nuts, Stones, &c.

Hop-Garden.

Now carry dung into your Hop-garden, and mix it with store of Earth, that it may rot against the Spring.

Apiary.

You may this month stop up your Bees close, so that you leave breathing vents; or you may house them till March.

DECEMBER

DECEMBER.

Day	Sun rise. h. m.	Sun set. h. m.
1		
2		
3	8 15	3 45
4		
5		
6		
7		
8		
9		
10		
11		
12	8 17	3 43
13		
14		
15		
16		
17		
18		
19		
20	8 15	3 45
21	Thomas Ap.	
22		
23		
24		
25	Christmas.	
26	St. Stephen.	
27	8 10	3 50
28	Innocents.	
29		
30		
31		

Right foot of Gemini sets in the Morning.
The Lesser Dog-Star sets in the Morning.

Sun in Capricorn, Solstice.

Arcturus sets in the Evening.

Cor Hydra sets in the Morning.

Right shoulder of Orion riseth in the Evening.

St. John Evangelist.

The left foot of Gemini rises in the Evening.

P *Habes* now leaves us the shortest days and longest nights, is newly entered *Capricornus*, the most Southern Cœlestial Sign, and begins his Annual return; which very much rejoyceth the Country-mans heart, to see a lengthning of the day, although accompanied with increase of Cold. The Earth is generally fast locked up under its frozen Coat, that the Husbandman hath leisure to sit and spend what store he hath before-hand provided.

CHAP.

*Frigoribus parto agricola plerumque fruuntur,
Mutuaque inter se leti convivia curant.*

Now is it time to house old Cattle: Cut all sorts of Timber and other Trees for Building, or other Utensils: fell Coppices.

Plant all sorts of Trees that shed their Leaf, and are natural to our English Clime, and not too tender.

Let Horses blood: fat Swine, and kill them.

Plough

D E C E M B E R.

Plow up the Land for Beans ; drain Corn-fields where water offends, and water or overflow your Meadows.

Destroy Ant-hills.

Garden and Orchard.

YOU may now set such Fruit-trees as are not very tender, and subject to the injury of the Frost.

Also transplant any sort of Fruit-trees in open weather : Plant Vines, and other Slips and Sions, and Stocks for grafting.

Prune Vines if the weather be open.

Cover the Beds of Asparagus, Artichoaks and Strawberries, &c. with warm Horse-litter, Straw, &c. if not covered before.

Sow Beans and Pease if the Winter be moderate : trench ground, and dress it against the Spring.

Set Traps for Vermine, and pick out Snails out of the holes of walls, &c.

Sow or set Bay-Berries, Laurel-berries, &c. dropping ripe.

This Month may you dig up Liquorice.

Hop-Garden.

Dig a weedy Hop-garden, and carry Dung into it, and mix it with Earth.

Apiary.

Feed weak Stocks.

Annus in Angue latet.

CHAP.

C H A P. XIV.

Of the Prognosticks of Dearth or Scarcity, Plenty, Sickness, Heat, Cold, Frosts, Snow, Winds, Rain, Hail, Thunder, &c.

WE have in the preceding Discourse discovered unto you the Reasons of, and the best, newest, and most Rational Methods and Ways, for the better Improvement of any sort of Lands capable thereof; and have given you a *Kalendar* of the most select Times and Seasons in the Year, for the performance of most of *Rural Affairs* abroad; and also an account of the Rising, Setting, &c. of several of the fixed Stars, formerly observed by the *Ancients* in ordering their Rustick Affairs. Yet remaineth there a more peculiar Art or Science, equally necessary with (if not more than) any of the former; and that is to foresee or understand what shall or may probably be, before it comes to pass; which is of so great concernment, that could men but attain to it, that alone were Art enough, not only to raise their own Fortunes, but advantage the whole Kingdom, by laying up Stores in time of Plenty, to supply the defects of Scarcity.

That there is such fore-knowledge in some measure attainable from the Natural Significations or Prognostications of *Comets*, unusual *Meteors*, &c. is most evident, because they are either Providentially placed as Signs, which must signify somewhat to come; or they are natural or accidental causes of some extraordinary and unusual effects that always succeed such rare Appearances. If we should deprive *Man* of this Spirit, or Art of fore-seeing or judging of future things from evident Signs and Tokens, we should instead of making him more excellent, set him a degree below the Beasts, and other Animals; who not only foresee the different changes of the Times and Seasons, but also prepare for them, as in the sublequent discourse will be made appear.

*Solers natura, & rerum genitabilis Ordo,
Certa suis studiis affixit signa futuri.*

Avien.

So that we are not naturally incapable of foreseeing what is to be, but we are prejudiced against the thing it self, because superstitious People (and blind as to things Divine) have in several Ages doated so much upon their own Attainments in this Art, that instead of making a Lawful use thereof, they have Religiously interposed it between themselves, and the true and living Spirit.

Spirit which hath begotten so great a prejudice against the thing it self, because of the abuse thereof, that it is generally deserted and neglected; and those that have any the least judgment or insight therein, much scorned and slighted by the Vulgar and Ignorant sort of people.

Which notwithstanding, (leaving the more Sublime Method of Predicting things to come in the greater Sphere, not at all conducing to our intentions, nor within our Rustick capacity to write of or apprehend) we will give a brief account of the common and natural significations of usual signs and tokens of *Heat, Drought, Cold, Rain, Tempests, &c.* on which depend, and from which usually proceed *Plenty, Scarcity, &c.* of *Corn, Hay, &c.* or the *sickness or welfare of Man, Beasts, &c.* All which are very necessary for our Country-men to understand; and, I hope, free from any thing of Superstition or Irreligion.

— *Qui hac omnia*

*Sciens operatus fuerit, inculpatur diis,
Auguria observans, & delicta evitans.*

The French *Rapins* give this his Advice to the Husbandman,

— *Therefore again,*

I must give warning to the Husbandman.

That he observe the Seasons, and with care

Read the Contents of the Cælestial Sphear:

That he takes notice in the Monthly State,

And Order, how the Stars discriminate.

What alterations, in the calmer Air,

The East, and troubled Southern Winds prepare:

That from the Rise and Setting of the Sun,

And by the Aspect of the horned Moon,

Showers to come, and Tempests he presage.

S E C T. I.

*Of the different Appearances of the Sun, Moon, Stars, Meteors,
or any other thing in the Air above us.*

*Of the motions
colours, and
appearances of
the seven Plan-
ets.*

THe most Principal of Natural Causes of all Changes and Variations of the Seasons of the Year, and the different degrees of Heat, Cold, Driness, Moisture, &c. in those Seasons, are first the *Sun*, then the *Moon*, and other of the moveable *Stars* or *Planets*; but more especially the *Sun*, whose distance or nearness unto us, or rather, whose obliquity or Perpendicularity, in respect of any part of this Globe, doth beget that most apparent variety in the different seasons, which indeed would be certain, were there not intervening causes that did divert the general influence of the *Sun*, and sometimes aggravate, and sometimes impede the extremes of Weather, &c. occasioned by it: But let those alterations in the *Air* or above us, be what they will, there are some certain

Prodomi

Prodromi that give us to understand thereof, and none more than the *Sun*, as Principal in the Heavens: next unto it the *Moon*; as *Virgil*:

*Si vero Solem ad rapidum, Lunasque sequentes
Ordine respicies: nunquam te crastina fallet
Hora.*

The *Sun* doth indicate unto us the true temperament of the *Air*, of the *Sun* through which we receive its beams; and according to its density or rarity thereof do we perceive that *Luminous Globe*; as if the *Air* be serene and clear, then do we most perfectly receive the Beams of the *Sun*: the weather is then most inclinable to driness, and according to the Wind, so is it either hot or cold; which if it be either *East* or *North-East* in the forepart of the *Summer*, the weather is like to continue dry: and if *Westward* towards the end of the *Summer*, then will it continue also dry: but upon the approach of Rain, the *Air* is usually repleat with moist Vapours, which are not of themselves so evidently discernable to the eye, and yet are plainly demonstrated by the *Sun*.

*Sol quoque & exoriens, & cum se condet in undas
Signa dabit: Solem certissima signa sequentur.*

Virgil.

Before Rain the *Sun* appears dim, faint and watrish; which presageth Rain to follow.

At the rising of the *Sun*, if it appear red or pale, and afterward dark, or hid in a black watry Cloud, Rain follows; or if the Sun-beams appear before the Sun-rising, or a watry Circle about the *Sun* in the Morning; or if the *Sun* appear hollow, or have red or black Clouds about it at the rising; or if the Beams be faint, or short, or watrish; *Suspecti tibi sint Imbres*,—Rain usuall follows: For the *Air* being pregnant with moisture, which usuall precedes Rains, &c. doth represent the *Sun* and Sun-beams, different in form and colour from what it appears to be at other times; as some sorts of Glass being interposed, doth present Objects different from what they are.

The Setting clear and red, and rising grey, and afterwards clear of the *Sun* indicates a fair day to follow.

The appearance of the *Sun* being very red at any time, but especially in the evening, Wind succeeds.

*When Heaven forsaking, Sol is near his Set,
Then oft mixt colours in his face we find;
The Azure threatens Rain: The fiery Wind.
But if the spots red flasbes shall unfold,
All vext with Rain and Wind thou shalt behold;
That night shall none perswade me to the Sea.*

*Clandestine Tumults he doth oft forebrow,
And open War from secret Plots to grow:
He pitying Rome, at Cæsars funeral spread
A mourning Veil o're his Illustrious head,
That th'impious age eternal darkness fear'd,
At Sea and Land what wonders there appear'd.*

Virgil.

Any redness in the Air precedes winds; which colour is caused from the more coagulated or digested viscous moisture, than that which causeth Rain, from which coagulated or digested moisture winds are usually generated; but the cause of the redness above any other colour, is the same as it is in some Glasses and transparent Stones, which although perfectly white, represent objects (also white) yet red unto our eyes, as well as other colours: The Reasons thereof I leave to the more Learned to discuss.

The same density or coagulation of the Air represents the Matutine or Vespertine Sun or Moon larger unto our sight than at other times, and usually precedes winds; and the reason why these Orbs appear greater in the Morning or Evening than at other times is, because there is more of this dense Air interposed between the object and the sight then, than at any other time.

Of the Moon.

The most principal significator of the varieties of weather, the Countryman esteems the Moon to be, not only from its Configurations and Aspects with the Sun and other Planets, which old-fashion'd Astrologers and ignorant Philosophers have put into their heads; as that the Change, Full, &c. being in such and such Signs, such weather shall follow; which if true, then should we have the weather every year alike, (the same Aspects falling out very near the same time every year) which every Country Coridon can contradict.

But also from its Prognosticks of the several changes of weather from its colour and appearance to our eye, which are more certain and useful for us to follow.

*And that we may by certain tokens find
When heat and Rain will be, when Stormy Wind,
The Moon great Jove appointed to preshew.*

Virgil.

The same Rules concerning the different appearances of the Sun, may also serve for the Moon, being all from the same cause.

If one Circle appear about the Moon, it signifies Rain.

But if more Circles appear, they signify Winds and Tempests to follow.

Also if the Horns of the Moon appear blunt or short, it signifies a moist Air, and inclinable to Rain.

But that Vulgar Error of the hanging or tending of the Horns this or that way, to presage any alteration of weather, is wholly to be rejected, every year they tending the same way, at the same time of the year: and also that error of judging the Weather for that Moon, by what it is two or three days after the Change; which only demonstrates the Natural inclination of the Air at that time: The same Rule may be observed at any other time of the Moon.

Of two or
three Moons.

Sometimes it so happens that two or three Moons appear at a time, which is usually two or three days before or after the Full. And are presages of great Rains, Wind, and unseasonable Weather for a long time to follow, the like effects proceed from *Parelii* or *Mocksuns*, but they appear not so usually, and are fore-runners of greater Calamities.

Of the other
Erraticks,
or Planets.

The different Aspects of the Planets one with the other, and also Eclipses, do undoubtedly either occasion or predict various mutations and changes

ges in most of our Sublunary Affairs, and more especially in this of the Weather : But the ignorance and fondness of men is such, that they only rely upon the Rules and Precepts of the *Ancients*, and conceive them to be perpetual, when the Aspects of these Planets vary *ad infinitum*, and so of necessity must the effects. Also, these Authors made those observations in such Countries where the seasons and variations of weather more exactly followed the Celestial Configurations, than in these more oblique Climates, where there are other concomitant causes intermixed: so that men ought rather to study and observe the different effects in these parts and times from those in other Countries, and the occasions of such differences, rather than to presume too much upon uncertain Rules and Methods, which begets scorn and derision in the ignorant, who are the only enemies to Art.

Scientia non habet Inimicum, præter Ignorantem.

And frustrates the expectations, and discourages the Ingenious: For undoubtedly *Eclipses, Conjunctions, Oppositions, &c.* have some influence on this Globe, though we apprehend them not as we might.

These unusual and extraordinary appearances above us, are undoubtedly ingendred or formed of some Vapours and viscous matter congealed or coagulated, and congregated together into a certain *Mass* or *Lump*; which being more remote from us than the Clouds, are represented to our sight through the perspicuous body of the Air, to be round. Their motion is always irregular and uncertain; and according to their substance, whether more or less gross or subtil, so do they appear either clearer or dimmer to the Eye; they are never so dense or gross, but that the Beams of the Sun penetrates them: which are evidently conspicuous in the clear and dark nights, except the light of either Sun or Moon be near it, then the Tail (as they usually term it) or Beams of the Sun penetrating it, are lost, or much diminished.

Of Comets, or Blazing-Stars

The matter whereof they are compounded or formed is various, according to the part or places of the World from whence they were extracted: also their digestion or coagulation is more in some than in others, which manifestly appears by their different colours and substances, and from their effects, which only operate in those parts of the World where they resolve themselves again.

They neither flame nor burn, as is fabulously supposed, but move as other Meteors do, from a certain expence of their own substance the one way, which enforceth their motion another.

When they are spent, the matter whereof they are compounded doth tend to this Globe, as all other substances do within the *Magnetic* or *Attractive* power thereof: so that on what part or Country of this Globe the matter resides, there may they expect the effects thereof, which are various.

Sometimes great Rains succeed, as it was after the Comet in 584 that it was then believed a second Deluge or universal Flood to have been prepared for the drowning of the whole World!

Sometimes great heat and drought, as did the next Summer after the Comet in 1472. in *January*; which was of such strength and vehemency, that in some places the fire burst out, &c. Also there followed mortal Maladies, loathsome Sickneses, most noisome and infectious, &c. (in *Germany*.)

Germany:) of which Nature that Comet seemed to be, that appeared to us in *England*, in *December* 1664. after which succeeded great drought, heat, and want of Rain, and that great and terrible Plague in 1665, and great heat and drought, and Pestilential Diseases in 1666, and 1667, and that never to be forgotten Fire or burning of *London*. In the beginning of *March* 1672. appeared another Comet which not only portended the *French* Kings entering into *Holland* almost to *Amsterdam*, but a great drought that followed and dried up the waters, so that it facilitated the passage for his Army.

*At si contigerit plures Ardere Cometæ,
Invalidas segetes torrebit siccior Aer.*

More might be said, both as to their Causes, Motions and Effects; but as it belongs to higher Capacities than our Country Reader to apprehend, so it requires the able Pens of more sublime Philosophers to treat of.

Of the shooting
of Stars.

There are certain lesser Meteors that never attain to the magnitude of Comets; yet seem to be composed of the same matter, and to produce the like effects, though in a far less degree: they are visible only in their motion, and seem as though Streams of fire issued from them: As the Poet saith;

*Oft also thou, before a Storm arise,
Shalt see bright Stars shoot headlong through the Skyes;
Leaving behind them a long train of Light,
Guilding a Trait through Sable Shades of Night.*

Which are no otherwise fire than the dashing of Salt-water in a dark night, or that moist light of several Marine Creatures, or of shining wood, or of the scraping of Loaf-Sugar in the dark.

The light proceeding from these Meteors, is meerly from the expence of their matter by the swiftness of their motion; which matter being dissipated, descends nearer unto this Globe, and afterwards becomes the cause from whence Winds, Rain, Mists, or Fogs proceed; according as the matter is more or less in quantity, or more or less gross or subtil in substance; as is evident from every Country-mans Observation and Experience.

Of the fixed
Stars.

The Ancients relied much on the Rising, Setting, and appearing of the Fixed Stars: *Virgil*.

*Præterea tam sunt Arcturi sidera nobis,
Hædorumque dies servandi, & Lucidus anguis, &c.*

On which days depended their most principal Rules of Agriculture; but it was in those parts of Climates, as we said before, where times and seasons were not subject to so great a variation, as in these.

We therefore need observe no more than their appearances, as they are visible unto us; that is, whether they be clear or dim, or whether they seem to be more or fewer in number than they usually do, &c.

If any of the greater Stars seem to have a Circle about them, or twinkle; or appear greater than usual, or appear dim, or their Rays blunt, or appear fewer in number, you may expect Rain, the Air being inclinable thereunto. Also

Also if they appear very thick, and more in number than usual, it indicates the Air to be rare and thin, and the more capable of Rain; and also Prognosticates tempestuous weather to follow.

From the same cause as Comets or shooting-Stars, may flashes of fire in several forms be produced; which may also presage or signifie the same things to come. *Of Fire or other casual appearances.*

But they are usually more terrible, and from more strong causes, and do usually produce more violent effects; as fierce Tempests, &c.

*Quod si diversis se passim partibus ignes
Excutiant: Verret pelagus sine fine modoque
Turba procellarum.*

Avien.

If these flashes appear in the form of Lightning, without either Clouds or Thunder, Winds and Rain usually succeeds from that Coast the light is observed; if from several Coasts, great Tempests follow.

If the Air seem to be lighter than at other times, the Sun and Moon being remote, it denoteth Winds and Rain to follow.

Before great Sickneses, or Pestilential Diseases, lights in the Air, &c. have been observed.

Also the Clouds themselves, as they vary in form and colour, or motion, do indicate unto us the Weather we are to expect. *Of the Clouds.*

In a clear evening, certain small black Clouds appearing, are undoubted signs of Rain to follow, or if black, blew, or green Clouds appear near the Sun at any time of the day, or Moon by night, Rain usually follows.

In a fair day, if the Sky seem to be dappled with white Clouds, (which they usually term a Mackarel-Sky) it usually predicts Rain.

If great black Clouds come out of the North, and appear whitish when nearer to you, and the season be cold and dry, it signifies Snow or Hail.

If Clouds be very high, and move another way than the Wind blows, or than the other Clouds move that are lower, the Wind either riseth or turneth.

If they appear like Flocks of Sheep, or of a red colour, Wind also follows.

If small watrish Clouds appear on the tops of hills, Rain follows, as they observe in Cornwall.

When Hengsten is wrapped with a Cloud, a Shower follows soon after.

The like they observe of Rosemary-topping in York-shire, and many other Places in England.

If Clouds move towards the Sun, it denotes Wind and Tempest.

If Clouds rest over the Sun at Sun-rising, and make as it were an Eclipse, it portendeth Winds; if from the South, Winds and Rain.

If in a clear day single Clouds flye apace, Winds are expected from that place whence they come.

If Clouds grow or appear suddenly, the Air otherwise free from Clouds, it signifies Tempests at hand, especially if they appear towards the South or West.

Mists and Fogs are of divers natures; some are the effects of Shooting-Stars, and other Meteors; and these are more general: sometimes they are very gross and stinking, they are then to be avoided as much as you can. *Of Mists and Fogs.*

can: their significations, as to the change of Air, are various; if they vanish or fall without a Wind, fair weather usually succeeds.

The white *Mists* that usually ascend in a Morning from the low grounds in a clear Air, if they vanish, or settle again in the Valleys, fair weather succeeds: but if they take to the Hills, or mount aloft, it demonstrates the watry inclination of the Air; therefore expect Rain.

of Winds.

In the more Southerly Regions, the Winds are much more certain than in these, and the effects of them also more certain: For notwithstanding the Rules and Observations of our *English Philosophers*, as to the strict place of the Wind, expecting thence a certain effect, you will find such Fancies to deceive you: For although the Wind being exactly in the *South South-East* Point, it Rains to day, yet another day the wind may be in the same place, and yet be fair Weather. Also that Wind that brings Rain to the one part of this Island, may not to another: for I observe the propinquity of the Sea is to be considered, every place lying nearer to some one part of the Sea than another; and on which Coast the Sea is nearest, that Wind more frequently brings Rain to that place than to another where the Sea is more remote: therefore I desire all such that expect any success to their Observations, that they quadrate the Rules to the places where they live, and not trust to the Observations of other places.

Winds are of different qualities, according to the several places they either proceed from, or pass over; as the *East-wind* is counted propitious neither to Man nor Beast, which I judge partly to be from the Fens or moist Countries; as *Holland*, the Fens in *York-shire*, *Lincoln-shire*, *Cambridge-shire*, &c. From whence Winds usually proceed, and must of necessity prove unwholesome both to Man and Beast, except to those that inhabit on the Western Coast; for the Wind hath sufficiently purged it self by passing over so much Land, as to leave its noxious quality behind it.

Also the *Northern Winds* are more serene with us than the other: one cause, I suppose, is from the quantity of Land in *Scotland* and *England*, it comes over unto us, as is observed in other Countries, that from the *Continent* the coldest and most serene Winds proceed.

If the Wind turn to the *South* from any other Coast, or remove from the *South*, having been long there, it usually brings alteration of Weather.

Winds do produce several and various alterations and effects in the Air, in the Water, and in the Bodies of Men and Beasts; as the *South* and *West-winds* are usually more hot and moist, and not so clear as the other; the *North* and *East* are more clear, dry and cold.

Bacon deventis.

When the *South-wind* blows, the Sea is blew and clear; but when the *North-wind*, it is then black and obscure.

The *Eastern-winds* usually make our fresh waters much clearer than the *West*.

The *North-wind* is best for sowing of Seed, the *South* for Grafting or Inoculations.

The *South-wind* is the worst for the bodies of men; it dejecteth the appetite, it bringeth Pestilential Diseases, increaseth Rheums; men are more dull and slow then, than at other times: Beasts also are not to be exempted from these influences.

The

The *North-wind* makes men more chearfull, and begets a better appetite to meat; yet is injurious to the Cough, Pile, and Gout, and any acute Flux.

The *Eastern-wind* is drier, more biting, and deadly.

The *West-wind* is moist, mild and calm, and friendly to all Vegetables.

The *East-wind* blowing much in the Spring, injureth Fruits by breeding Worms.

All Winds blowing much, cleanse the Air; still and quiet Summers being the most unwholsom, and subject to Pestilential and Epidemical Diseases.

If in great Rains the Winds rise or fall, it signifies that the Rain will forthwith cease.

If the Wind vary much in few hours, and then be constant to one place, it signifies the Wind to continue long in that place.

If at the beginning of the Winter the *South-wind* blow, and then the *North*, it is like to be a cold Winter; but if the *North-wind* first blow, and then the *South*, it will be a warm and mild Winter.

The blowing of the Winds from several Coasts (other concomitant causes concurring) are the truest Pre-significators of Thunder.

The blowing of the Winds aloft, with a murmuring or hollow noise more than below, commonly presageth Rain.

*Before a Storm, either the Ocean swells,
Or mighty sounds are heard in lofty hills,
Shores far off, Thunder-beaten with the Floods,
And murmurs rise in the disturbed Woods,
Then Billows scarce will tallest Ships forbear.*

Virgil.

The blowing or compression of the Winds downwards causing smook to descend, &c. more than usual, signifies Rain to follow.

If the Winds blow directly downward, and cause a motion on the Water several ways, or force the dust to arise with the Wind, which is repelled by the Earth; if they also enforce the Hay, Corn, or other things in the Fields, up aloft into the Air, which denote unto us the crassitude of the Vapours in the Air, which by the heat of the Sun do emit such casual blasts; for they rarely happen but in the Summer, and the day time, (yet sometimes when no Cloud is near) they signify Wind, and sometimes Rain to succeed, other causes concurring, or otherwise extream heat.

But if these Whirl-winds are very great, they presage Tempests to be very nigh; as *Virgil*.

*Oft have I seen when Fields of Golden Corn
Were fit to reap, and ready to be born,
The warring Squadrons of the Winds contend,
And from the roots the wealthy Harvest rend;
Then boisterous Tempests with a Whirl-wind bear
Light Straw and Stubble through the cloudy Air,
Oft from the Sky descends a dreadful Show'r,
And muster'd Clouds from Sea recruit their pow'r
With hideous Storms.*

Of the Rain-
bow.

This watry *Meteor*, and the greatest Miracle in Nature, (besides its Divine signification) being produced of natural causes, hath also its natural effects. In some Countries more *Southward*, it is an Ordinary Prefage of great Tempests at hand; but here various Weather succeeds, according to its various appearances and colours.

It is the lowest of *Meteors* (saith *Bacon*) and when it appears in parts, and not whole or conjoyned, it produceth Winds and Rain.

If it appear double or tripple, it usually presageth Rain.

If the colours thereof tend more to red then any other colour, Wind follows; if green or blew predominate, then Rain.

Of Noise and
stillness in the
Air.

The Audibility of Sounds are certain Prognosticks of the temper of the Air in a still Evening: For if the Air be replete with moisture over us, it depresseth sounds, that they become Audible at a far greater distance than when the Air is free from such moisture or vapours; as you may observe in building, the lower and more ponderous the Roof or Floor next you is, the farther and plainer may you hear any thing therein; which is the true cause of the quick hearing, at the whispering place in *Gloucester-Cathedral*; which is not only from the closeness of the Passage as is generally conceived, but from the weight and Massiness of the Building over it. The like I have observed in Rooms covered with Lead, Stone, &c. and in places under large Cisterns of Water.

From whence you may conclude, that in such nights, or other times that you hear sounds of Bells, noises of Water, Beasts, Birds, or any other sounds or noises more plainly than at other times, the Air is inclinable to Rain, which commonly succeeds.

Of Echoes.
Of Thunder
and Light-
ning.

The same may be said of *Echoes*, as of other noises and sounds.

When it Thunders more than it Lightens, it signifies great Winds; but if it Lighten oftner than it Thunders, it signifies great and hasty Showers.

Morning-Thunders signify Wind, Noon-Thunders Rain, roaring or distant Thunders signify Wind; but cracking or accute Thunders Winds and Rain.

Of the rarity
and density of
the Air.

According to the Opinion and Rules of others, and our own Observation, we have given you the best and most probable indications of the future changes of the Wind, Weather, &c. from the several and usual appearances above, either certain or uncertain, or accidental. Now it remains that we say somewhat in relation to the temper or qualification of the Air it self, deducted from its own being more rare or expanded, or more dense or contracted.

We shall not take any further notice of the nature of the Air in this place, than it serves to our present intention, which is only to demonstrate unto you, that the Air is an absolute Body fluid and transparent, and in several particulars like unto the water, both being penetrable alike by their several Inhabitants; the Fish with an equal facility piercing the waters, as Fowls do the Air: they are both nutriments to their several Animals residing in them; they both obstruct the Visual Faculty alike, as they are more or less dense; they are both subject to Expansion or Contraction, but the Air more; they are both subject to Undulation, as they are fluid.

The Air is also capable to support great burdens, as the vast quantities of water that flow over our heads in stormy or rainy weather, which, according

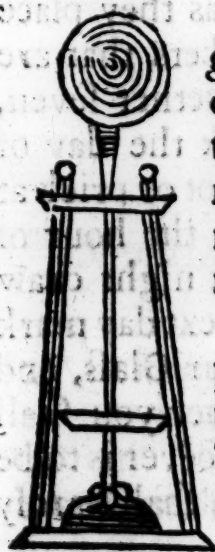
according to the rarity and density of the Air, do gradually diffuse themselves upon the Earth; as is most evident in the more hot and Southerly Countries, where the Air is more hot and thin, there Rain falls with that violence, as though it were water poured forth: when in the more Northerly, where the Air is more dense or gross, it distills in minute drops, as it were cribrated through the thick Air. We also may discern a manifest difference; for in the warmer Seasons of the year, the Air being then most thin, the Rain falls in greatest drops, and in the colder seasons, when the Air is most dense, the Rain distills in smaller.

So that when the waters are above us, or that Clouds or Floods of water are in being in the Air, we have only to judge whether they incline towards us, or that they are for some other place.

This rarity or density of the Air cannot be judged by the sight; for it is usual when the Air it self is most rare, then is it most replete with vapours, &c. as water, the more it is heated, the less transparent it becomes.

Neither can it be judged by its weight, as many do imagine and affirm from Fallacious Experiments; for the Air is not ponderous in its own proper place, no otherwise than water is in the Sea in its proper place; although it be asserted by high flown Philosophers, and Learned Pens, with whom it is besides our Primary intentions to contend in this place, it being enough here to discover to our Country Reader these mysterious Intricacies of Nature (as they would have them esteemed) by familiar Examples and Demonstrations.

For the true Discovery of the Nature and temper of the Air, as to its density or rarity, we have not met with a more certain or compleat invention than the *Weather glass*; the various and intricate Descriptions whereof we will not insist upon, but take our Observations from the most plain and ordinary single perpendicular Glass, being only as follows.



Procure at the *Glass-house*, or else where, a *Globular glass*, with a Tube or Pipe thereto proportionable, whereof there are many sizes; but be sure let not the Head be too big, nor the Pipe too short, lest there be not rise enough in the Winter; or fall enough in the Summer. You must also have a small Glass or Vessel at the bottom, that may contain water enough to fill the Tube, or more.

Then having fixed them in some frame made for that purpose, heat the Globe of the Glass with a warm Cloth, to rarify the Air within it; and then put the end of the Tube into the lower Vessel, and it will attract the water more or less, as you warmed the head.

You may also add numbers on the Glass, to shew you the degrees.

The Water you may make blew with *Roman Vtriol* boyled, or red with *Rose-leaves* dry, and imbibed in fair water, wherein a little *Oyl of Vtriol*, or *Spirit of Salt* is droped. With this water fill the under Vessel; which being rightly placed on the North-side of your house, where the Sun rarely or never shineth against it, and in a Room where you seldom make fire, lest the sudden access of heat, or accidental alteration of the Air, might impede your Observations.

The Air included within the Globe or Ball of this Glass, doth admit of Dilation and contraction equally with the Ambient Air, that whatsoever the Ambient Air is dilated or expanded, either through the heat of the season, or before the fall of Rain, &c. The Air in the Glass is the same; and as by its Expansion it requires more room, so doth it let the water in the Tube descend gradually; or as it is more dense or contracted, either through the coldness of the season, or the serenity or inclinability to draught of the Ambient Air, so also doth the Air within the Glass contract it self into a less compass, and sucketh up the water in the Tube gradually, as it condenseth or contracteth: whence you may at any time exactly know the very degree of Rarity or Density of the Air Ambient, by that which is included in the Glass, and thereby inform your self what weather is most likely to succeed at any time.

Be sure to Quadrate or Contemporize your observations or numbers of degrees with the season of the year; for that degree of Rarity that signifies Rain in the Winter, may be such a Degree of Density that may signify fair weather in the Summer.

The differences betwixt the highest rise and lowest fall in one day in the Summer, is much more than in the Winter; for you shall have a cold night, and very serene Air, which contracteth the Air in the Glass into a little Room; after which usually succeeds a very hot day, which dilateth it very much; when in the Winter no such great difference happens in one day.

Yet in the Winter, in several days, will the difference be as great as in several Summer days.

Although the Air appear serene and cold to your senses, yet trust not to that, if the Glass signify otherwise.

We shall not give you any sure Rule by which you may judge of the Weather, but leave it to your own observations; that is, draw on a paper a certain number of lines, as many as you think fit, as Musicians draw lines to prick their Tunes on; at the end whereof, as they place their Key, so number your lines according to those numbers that are next unto the top of the water in the Tube of the Glass, whether seven, eight, nine, ten, eleven, twelve, &c. Over this scale mark the day of the Month, and point of the Wind: in the Scale make a dot or prick at what line or number the water in the Glass is at, and by it the hour of the day, and under it the inclination of the Weather: At night draw a line down right like the Musicians full time or note; the next day mark as before, untill you know and understand the nature of your Glass, and the place it stands in, and the season of the year: so that then you shall be able at any time to give a probable conjecture of whatsoever is to be known or signified by that Instrument which otherwise you shall hardly do.

of the Baro-
scope.

This new invented Instrument, which is termed the Baroscope, by which the Authors thereof pretend to discover the temper and inclination of the Air from its weight (in brief) is thus described: Seal a Glass tube Hermetically at the one end, fill it almost with Quick-silver; and invert it, resting the open end in a vessel of Quick-silver; then the Quick-silver in the Tube by its weight, presseth downwards into the Vessel, and so descendeth or sinketh the Air, (which is but little) remaining in the Glass, that the summit of the Tube is for a small space void

void of Quick-silver, so far as that small portion or remainder of Air is capable of distention; which is much more by Quick-silver, the most ponderous of fluid Bodies, than by water in the *Weather-glass*. But they pretend that this Column of Quick-silver in the Tube, is supported by the weight of the Air Ambient, pressing on the stagnant Quick-silver in the Vessel; and that as the Air becomes more or less ponderous, so doth the Quick-silver in the Tube rise or fall more or less accordingly: which if it were true, then in case the stagnant Quick-silver were broader in a broader vessel, would the greater quantity of Air press harder upon it, and the Quick-silver in the Tube rise higher; but it doth not. Also if the Quick-silver in the Tube were supported by the pressure or weight of the Air on the stagnant Quick-silver in the Vessel, then would not the Quick-silver descent by the making of some small hole on the top of the Tube, which we evidently perceive to do.

Also when the Air is most rare, and by consequence less ponderous, (if any weight thereof should be supposed) then will the Column of Quick-silver in the Tube be higher; and when the Air is more dense or burdened with the moisture, then will it be lower: The contrary whereof would happen, if their *Hypothesis* were true.

But most evident it is, that as the Ambient Air becomes more or less rare or dense, so doth the Air in the Tube contract or dilate it self; which is the sole cause of the rise or fall of the Quick-silver.

Much more might be said herein, and also of the *Weather-glass* or *Thermoscope*; but I hope this may suffice to induct inquisitive, and not exact and perfect Artists: The full discourse and discovery of the various effects, observations and conclusions of these Instruments, requiring rather a Tract peculiar and proper for them only.

There is also another Instrument that may be made more exact for any of the aforesaid observations or intentions, and fit for further discoveries; but my occasions will not at present give me leave to perfect it.

SECT II.

Of Observations and Prognosticks taken from the Earth and Water.

IF the Earth appear more dry than ordinary, or if it greedily drink in *Of the Earth* Rains lately fallen, or Floods suddenly abate, it signifies more Rain to follow.

I have often observed that the sinking of Rivers more than usual at such season of the year hath been a certain preface of much Rain to follow. And that the continuing full of Rivers after Rain, hath been a sure preface of dry weather.

If the Earth, or any moist or Fenny places yield any extraordinary scents or smells, it presageth Rain.

If the water, being formerly very clear, change to be dim or thick, *Of the Water* it signifies Rain.

If Dews lie long in a morning on the Grass, &c. it signifies fair weather, the Air then being more serene, and not of an attractive or spongy nature.

If Dews rise or vanish suddenly and early in the morning, it presages Rain.

If Marble-stones, Metals, &c. appear moist, it indicates the Inclination of the Air to be moist, and subject to Rain.

But, if in a Morning a dew be on the Glass in the Window, and on the inside, it signifies a serene and cool Air, and inclinable to drought.

Of the Sea.

If the Sea appear very calm with a murmuring noise, it signifies Wind.

If on the surface of the Sea, you discern white froth like unto Crowns or Bracelets, it signifies Wind; and the more plainly they appear, the greater will the Wind and Tempests be.

If the Waves swell without Winds, or the Tide rise higher, or come ashore more swift than usual, it presageth Winds.

S E C T. III.

Of Observations and Prognosticks taken from Beasts.

IT is a thing worthy of admiration and consideration, how the Beasts of the Field, Fowls of the Air, &c. should be capable of so great a degree of knowledge and understanding, as to foresee the different changes and varieties of seasons; and not from common observations, as man doth, but from a certain instinct of Nature, as is most evident.

Of Bees or Kine, &c.

Several significations of the change of Weather are taken from the different postures of these Beasts; as, if they lie on their right side, or look towards the South, or look upwards, as though they would snuff up the Air; according to the Poet,

*Steers viewing Heaven, of Rain will Judgment make,
And at wide Nostrils the Preception take.*

It is observed that in a herd of these Beasts, as they are on their March towards their Pastures in a Morning, if the Bull lead the Van and keep back his company that they go not before him, it is a Pronostick of rain or Tempestuous weather, but if he be careless and let them go at random, the contrary.

Or if they eat more than ordinary, or lick their Hoofs all about.

Convenit instantes praeoscere. protinus Imbres,

Avien.

Rain follows forthwith.

If they run to and fro more than ordinary, flinging and kicking, and extending their Tails, Tempests usually follow.

Of Sheep.

If Sheep feed more than ordinary, it signifies Rain; or if the Rams skip up and down, and eat greedily.

Of Kids.

If Kids leap or stand upright, or gather together in Flocks or Herds, and feed near together, it presageth Rain.

If

If the Ass bray more than ordinary, or without any other apparent *of Asses.* cause, it presageth Rain or Winds.

If Dogs howl, or dig holes in the Earth, or scrape at the Walls of the *of Dogs.* house, &c. more than usual, they thereby presage death to some person in that house, if sick; or at least Tempestuous weather to succeed.

If the hair of dogs smell stronger than usual, or their guts rumble and make a noise, it presageth, Rain or Snow; or they tumble up and down.

The Cat by washing her face, and putting her foot over her Ear, fore-*of Cats.* shews Rain.

It hath been anciently observed, that before the fall of a house, the *of Mice and Rats.* Rats and Mice have forsaken it.

The squeeking and skipping up and down of Mice and Rats portend Rain.

—Parvi cum stridunt denique Mures,
Cum gestire solo, cum ludere forte videntur,
Portendunt crasso consurgere Nubila Caelo.

Avien.

Of all Creatures, the Swine is most troubled against Wind or Tempests, *of Swine.* which make Countrey-men think that only they see the Wind.

They usually shake Straw in their mouths against Rain: As *Vergil.*

—Ore solutus
Immundi meminere sues jactare Maniplos.

If they play much it signifies the same.

SECT. IV.

Of Observations and Prognosticks taken from Fowl.

AS Beasts, so Birds have a certain fore-sight of the change of weather, and alterations of the seasons, and especially water-Fowl; which if they fly or gather together in great flights, and from the Sea or great waters hatten to the banks or shore, and there sport themselves, it denotes Winds; more especially if in the morning.

If the Breast-bone of a Duck be red, it signifies a long Winter; if white, the contrary.

Duck and Geese, &c. picking their Wings, washing themselves much, or cackling much, signifies Rain.

Also Sea-fowl seeking after fresh waters, signify an open or wet season.

Jam varias Pelagi volucres, & que
Dulcibus in stagnis rimantur, &c.

*All sorts of Various Sea fowl, which in Ranks,
Flaunt Brittilsh Lakes, or Crown the watry Banks,
With sprinkled water then their Wings belave,
And now their heads they level with the Wave,
Or under Water thou maist see them dive,
And in their sportfull washing vainly strive,
Foul Weather threat.*

If they betake themselves to great Waters, it presageth cold; if *Water-fowl* forsake the Water, it signifies that *Winter* is at hand.

of Land-fowl If *Land-Fowl* gather towards the Water, and shake their Wings, making noises, and washing themselves, it portendeth Tempests at hand.

If small Birds gather together in Flocks, it signifies cold and hard weather at hand.

If Birds seek shelter in Barns or Houses more than usual, it presages cold and hard weather.

of Birds If Birds fly hastily to their Nests, and forsake their Meat, it foresheweth Tempests.

If in Frosty weather Birds seek obscure places, and seem dull and heavy, it signifieth a sudden Thaw.

The early appearance of Field-fares, or other Forreign Winter-fowl, presageth a hard Winter.

Rooks, Owls, Jays, or such like wild fowl, frequenting a Town more than usual, presage Mortality and Sicknes to that place.

of the Heron. If the *Heron* soar high, seemingly even to the Clouds, it signifies wind.

If the *Heron* stand Melancholly on the Banks, it signifies Rain.

If the *Heron* cry in the night as she flies, it presageth Wind.

of the Kite.

If the *Kite* soar high, it signifies fair weather,

If they make more than ordinary noise or crying for Prey, it presageth Rain.

of the Crow.

If the *Crow* hath any interruption in her Note, like the Hiccough, or Croak with a kind of swallowing, it signifieth Wind and Rain.

*The Wicked Crow aloud foul-weather threats,
When alone on dry sands she proudly jets.*

Rooks or Crows gathering together in Flocks, and forsaking their meat, signify Rain.

The *Raven* or *Crow* Creaking clear, and reiterating her Note, signifies fair weather.

of Sparrows.

If *Sparrows* chirp earlier, or more than usual, it signifies Wind and Rain.

of the Jay.

If *Jays* gather together in Flocks, it signifies Rain and Tempestuous Weather.

of Bats.

If *Bats* fly abroad after Sun-set, it signifies fair weather.

of the Owl.

If *Owls* whoop at night, it signifies fair weather.

North Owl foretelling Rain.

From the high Roof, observing Phoebus set,

Will Idly then Nocturnal Notes repeat.

Virgil.

She will not sing against Rain.

The early singing of the Wood-Lark, signifies Rain.

If the Swallow fly low, and near the Waters, it presageth Rain. The coming of the Swallow is a true presage of the Spring.

*Of the Wood-Lark.
Of the Swallow low,
Of the Cock.*

If the Cock crow more than ordinary, especially in the Evening, or if Poultry go early to Roost, it signifies Rain.

There is a small Bird of the size and near of the Shape of a Martin, that at some times flies very near the water and near unto the Boats that pass, which is a most sure Prognostick of Tempestuous weather, never appearing but against such weather, as hath been constantly observed by the Boatmen in their passages over *Severn*, and on the Channel between the *Isle of Wight* and the main Land.

S E C T. V.

Of Observations and Prognosticks from Fishes and Insects.

IF *Porpises*, or other Sea-Fish leap in a calm, it signifies Wind and Rain. *Of Sea-Fish.*

If great numbers of the Fry of Fish are generated in Lakes or Ditches where Fish rarely come, it presageth scarcity of Corn, or death of Cattle. *Of Fresh-water Fish.*

If Fish leap more than ordinary in Ponds or Rivers, it presageth Winds and Rain.

Great quantities of Frogs, small or great, appearing at unusual times, and in unusual places, presage great Dearth of Corn, or great Sicknes to follow in that place where they appear. *Of Frogs.*

The Croaking of Frogs more than usual in the Evening, signifies Rain.

The early appearing of Snakes, signifies a dry Spring, and a hot Summer. *Of Snakes.*

If they play much in the Water, it signifies Rain.

If the Ant bring forth her Eggs, it presageth Rain. *Of Ants.*

If Bees fly not far, but hover about home, it presageth Rain; or if they make more haste home than ordinary, a Storm is at hand. *Of Bees.*

If Gnats, Flies or Fleas bite more keenly than at other times, it signifies Rain.

If Gnats or Flies swarm or gather together in multitudes before Sun-set, it presageth fair weather. *Of Gnats, Flies and Fleas.*

Swarms of Gnats or Flies in the morning, signifies Rain.

If greater numbers of Flies or Locusts appear more than ordinary, it signifies Sicknes or Mortality to Man or Beast, and also scarcity of Corn and Fruits.

The early appearance of these, or any other Insects in the Spring, prefigeth a hot and Aker Summer.

of Spiders.

If the Spiders undo their Webs, Tempests follow.

of the Wood.

of the Wood.

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The meaning whereof I presume may be, that whilst Spinsters are at their evening winter works, by discerning Spiders weaving their Webs, or busie about the house, or by discerning Mushrooms in their Candles or Lamps or sparkling &c. in them, they may thence preface foul weather to be at hand.

Chaffers, &c.

The great appearances of Chaffers, or other Insects, although they denote a present time of Plenty, yet are they Omens of a future time of Scarcity, and in very great numbers, of Mortality and Sicknes to Man and Beasts.

SECT. VI.

Promissuous Observations and Prognosticks.

of Trees and Vegetables.

Leaves of Trees and Chaff playing or moving without any sensible Gale or breath of Wind, and the Down or Whorl of Thistles and other Plants flying in the Air, and Feathers dancing on the Water preface Wind, and sometimes Rain.

As first long since observed.

Chaff should be observed, and falling down.

Or, perhaps, that which is observed on the ground.

If the Herb, or its leaves, is foreboded Rain.

If the Oak bear much Mast, it forebodes a long and hard Winter.

The same has been observed of Haws and Hips.

If Oak-apples ingender or breed Flies, it is said to preface Plenty; but if Spiders, Scarcity.

If

If Trees bear but little Fruit, it usually presageth Plenty; and if much, Scarcity. But this Rule is not always certain.

If the Broom be full of Flowers, it usually signifieth Plenty.

*Observe when first the Nuts begin to bloom,
And flourishing, bend the tender Branch; if these
Prove fruitfull, such shall be thy Corn's increase;
And in great heat huge Harvests shall be found;
But if with swelling Leaves the shades abound,
Then shalt thou thrash a Chaffy stalk in vain.*

This observation hath proved for the most part true for several years now past, as in 1673, 1674, there were but few Nuts, and cold and wet Harvests, in 1675, and 1676, were plenty of Nuts, and heavy and dry Harvests, but more especially in 1676, was a great shew of Nuts, and a very hot and dry harvest succeeded.

The sudden growth of Mushrooms presageth Rain.

*Et si nocturnis ardentibus undique testis
Concresecunt fungi—protinus Imbres.*

Avienus.

If Coals of Fire shine very clear, it presageth Wind.

If the Fire in Chimneys burn whiter than usual, and with a murmuring noise it denoteth Tempests.

If the Flame wave to and fro, it signifieth Wind. The same doth the Flame of a Candle.

*—Si flammis emicet ignis
Effluus, aut lucis substantia langueat ultro;
—Protinus Imbres.*

Avienus.

If Bunches like Mushrooms grow on the wick of the Candle or Lamp, it presageth Rain.

If fire shine much, or scald, or burn more than ordinary, it presageth cold: the contrary denoteth the contrary.

If wood crackle or breath more than usual in the Fire, it signifieth wind: if Flame cast forth many sparkles, it signifies the same.

if the Oyl in the Lamps sparkle, it signifies Rain.

If Ashes coagulate or grow in Lumps, it signifies the same.

If the fire in cold weather burn violently, and make a noise like the treading of Snow, it usually presageth Snow.

If Salt become moist, it signifies Rain: The same if the Rain raise bubbles as it falls, or if the heat of the Sun be more than ordinary, or Worms come out of the Earth, or Moles dig more than usual.

If after Rain come a cold wind, it signifies more Rain.

If in time of great cold the Air grow thick, and the cold abate, or if there be a dry cold without Frost, or if there appear signs of Cold in signs of Rain, it presageth Snow.

It is usual that a dry Autumn precedes a windy Winter; a windy Winter, a rainy Spring; a rainy Spring, a dry Summer; a dry Summer, a windy Autumn.

It is observed, that how far the Frost penetrates the Earth in the Winter, the heat shall in the Summer.

Increase of the Moon.

Many are of opinion that the Air and time of the Moon is to be considered in several Rural Affairs ; As that the increase is the most fit and best time for the killing of Beasts : And that young Cattle fallen in the Increase are the fittest to wean ; and that it is the best time to plant Vines, and other Fruit-trees ; to graft and to prune lean Trees, and cut Wood ; to sow Herbs and gather Tillage, and cut Meadows.

FBI

That at the Full Moon it is best to fly Hawks, take Marrow, and take Shell-fish, &c.

Decrease.

That at the Decrease it is best to geld young Cattle, to fell durable Timber, to gather fruits, sow and cut Corn, and lay up Corn; to prune gross Trees, to gather Grafts and Seeds, and to sow Cucumbers, Melons, Onions, and Artichokes.

DICTIONARY.

Dictionary Rusticum ;

OR, THE
INTERPRETATIONS
AND

SIGNIFICATIONS
OF SEVERAL
RUSTICK TERMS

Used in several Places of

ENGLAND:

And also the Names of several

INSTRUMENTS and MATERIALS

Used in this

MYSTERY of *AGRICULTURE*;

And other Intricate Expressions dispersed in our

Rural Authors.

L O N D O N,

Printed for *Thomas Dring*, over against the Inner Temple-Gate in
Fleet-Street, 1687.

Dictionary of Rural Economy

OF THE
INTERPRETATIONS

SIGNIFICATIONS

RUSTICK TERMS

AND

OF AGRICULTURE

Rural Authors.

Printed for Thomas Diney, over against the West-India Gate in Fleet Street, 1687.

READER

THis Dictionary, above any other part of this Book, may be thought Superfluous because it being intended only for the use of Husbandmen, they above all others best understand the Terms, and their several significations; so that herein we seem to instruct those that are best able to teach us; which might be true if they all spake the same Language: But there is such a Babel of Confusion, as well in their Terms and Names of things, as there is in the Practice of the Art of Agriculture it self, that remove a Husbandman but fifty or an hundred Miles from the place where he hath constantly exercised his Husbandry to another, and he shall not only admire their Method and Order in Tilling the Land, but also at their strange and uncouth Language and Terms, by which they term their Utensils, Instruments, or Materials they use, so much differing from those used in the Country where he dwells.

Also our several Authors that have Written of this Subject, very much differ in the Appellation of several things, they generally speaking in their Writings the Language of the Place and Age they lived in; that their Books read in another part of the Country, or in succeeding times, seem either Fabulous or Intricate. Wherefore, that our Authors and this present Tract may be the better understood, and that one Country-man may understand what another means in a remote place; I have here given you

To the Reader.

you the Interpretation and Signification of such Words and Terms that I remember I have read or heard; which I hope may satisfy and supply that defect of such a Dictionary that hath been so long complained of. If any Terms are wanting, or not rightly Interpreted, I desire you to consider the place you live in, where perhaps may be some Terms used or so Interpreted, that I are not so in any other place of England, which may I hope sufficiently excuse my Ignorance of them; or else they may be Terms so universally understood, that they need no Interpretation; as Wheat, Rye, Cart, Waggon, &c.

D I C T I O N A R Y

DICTIONARIUM RUSTICUM:

OR,

The INTERPRETATIONS and SIGNIFICATIONS
Of several
RUSTICK TERMS, &c.

A

A *Nes*, or *Annes*; the Spires or Beards of Barley, or other Bearded Grain.

Ablactation is one of the ways of Grafting; that is, weaning the Cion by degrees from its Mother; being not wholly to be cut therefrom till it be firmly united to the Stock on which it is grafted.

Ablaquation is the taking away the Earth, or uncovering the Roots of Trees.

An *Acre* is one hundred and sixty square Lug, or Pearch of Land, at sixteen foot and a half to the Perch; but of Coppice-wood eighteen foot to the Perch is the usual allowance. But an *Acre* sometimes is estimated by the proportion of Seed used on it; and so varies according to the Richness or sterility of the Land.

An *Acreme* of Land is ten Acres,

A *Welsh Acre* is usually two *English Acres*.

An *Adds* is a sharp tool made different from an Ax, and more convenient for the cutting of the hollow side of any Board or Timber; such as the Coopers generally make use of.

Aftermath, the after-grass or second movings of grass, or grass or stubble cut after Corn.

Agriculture, The Tilling or improving of Land.

Alp, a Bulfinch.

Alveary, a Hive of Bees.

Apiary, a place or Court where the Bees are kept.

An *Aqueduct*, a water.course or Carriage for Water.

Aquaticks, Plants delighting in the Water.

To *Are*, to Plough, from the Latin, *Aro*.

An *Ark*, a large Chest to put Fruit or Corn in, from the Latin word *Arca*.

Arders, Fallowings or Plowings of Ground.

Aromaticks, Plants Odoriferous, or having a Spicy smell.

R r

Aventies

Avenues, Ways or Passages, or Rows or Walks of Trees.

Aver, signifies a labouring Beast, from whence comes the Law word *Avent*, Cattle. And

Average, The feeding or Pasturage for Cattle especially the Edith or Roughings.

Aviary, a place where Birds are kept, or do resort unto.

Aumbry, a Country Word for a Cup-board to keep Victuals in.

Axletree, or *Axi*; that which the Wheel of a Cart, or such like, moveth on.

B

B *Ag*, or *Bigg*, the Udder of a Cow, in some places is called the *Cow's Bag*.

Balks, Ridges or Banks. And sometimes Poles or Rafter's over out-houses or Barns.

Barm, Yeast or rising used in fermenting, Ale, Beer, Bread, &c.

Barth, a warm place or Pasture for Calves or Lambs, &c.

Barrow, is of two sorts; either a *Hand-barrow*, or a *Wheel barrow*.

Barton, a Back-side.

Baven, Brush Faggots made with the Brush at length.

A Beck, a Brook or Rivulet.

Beefings, the first Milk from the Cow after Calving.

Beetle, or *Boyle*, a wooden Instrument wherewith they drive Wedges, Pikes, Stakes, &c.

Beverage, Drink, or mingled Drink.

A Bigge, a Pap or Teat.

A Bill is an edg-tool, at the end of a stale or a handle; if short, then it is called a *Hand-bill*; if long then a *Hedging-bill*.

A Billard is in some places used for an imperfect or Bastard Capon.

A Binn, a place made of Boards to put Corn in.

Blast, Corn is said to be blasted when it is poor and thin in the Ear, with little Flower in it.

Blight, See Mildew.

Blith, yielding Milk.

Bole, or *Boale*, the main Body of a Tree.

Boafe, in some places used for an Ox-Stall or Cow-Stall.

Boot, necessary Timber of Wood for necessary uses; as *Plough-boot*, *House-boot*, *Fire-boot*, &c.

Boreas, the North-East-wind.

Bouds, *Weevills* or *Popes*, Insects breeding in Malt.

Bow, an Ox-bow or Yoak.

Bragget, a Drink made with Honey and Spice, much used in *Wales*, *Cheshire*, and *Lancashire*.

Braken, or *Brake*, Fern.

A Brandrith, a Trevet or other Iron to set a Vessel on over the Fire.

Brank, *Buck*, or *French-wheat*; a Summer-grain, delighting in warm Land.

A Breast-Plough, a sort of Plough driven by main force with ones Breast, commonly used in parting the Turf in Burn-beating.

A Breck, or *Brack*, a gap in a Hedge.

Brim,

- Brim.* A Sow is said to go to Brim when she goes to Boar.
- To *Brite* or *bright* Barley, Wheat, and other Grain; and Hops are said to brite when they are over-ripe, and shatter.
- Browse* or *brouce*, or *brutte* the tops of the Branches of Trees that Cattle usually feed on.
- To *Burn-beat*, Vide *Den-shine*.
- A *Bud*, a weaned Calf of the first year, because the horns are then in the Bud.
- Bulchin*, a Calf.
- Bullen*, Hemp-stalks pilled.
- Bullimony*, or *Bullimong*, a mixture of several sorts of Grain, as Oats, Pease and Verches.
- Bushel*, in some places it is taken for two Strike, or two Bushels, and sometimes for more.
- C.
- Caddow*, a Jack-daw.
- A *Carre*, Woody moist Boggy-ground.
- Casings* or *Comblakes*, Cow-dung dried and used for fewel as it is in many places where other fewel is scarce.
- Cartwright*, one that makes Carts, Waggon, &c.
- Catch-land*, is Land which is not certainly known to what Parish it belongeth, and the Parson that first gets the Tythes of it enjoys it for that year, it seems there is some of this Land in *Norfolk*.
- To *Cave*, or *Chave*, is with a large Rake, or such like Instrument, to divide the greater from the lesser; as the larger Chaff from the Corn or smaller Chaff. Also larger coals from the lesser.
- Ceres*, the Goddess of Corn, Seeds and Tillage: also the Title of one of the Books of Mr. *Rea*, treating of Seeds.
- Chaff*, the Refuse, or Dust in winnowing of Corn.
- Champion*, Lands not inclosed, or large Fields, Downs or places without Woods or Hedges.
- Cheef-lip*, the bag wherein House-wives prepare and keep their Runnet or Rennet for their Chese.
- Chitting*, the Seed is said to chit when it shoots first its small root in the Earth.
- Cider*, or *Cyder*, a drink made of the juyce of Apples.
- A *Ciderist*, one that deals in Cider, or an affecter of Cider.
- Clogs*, pieces of Wood, or such like, fastned about the Necks, or to the Legs of Beasts, that they run not away.
- A *Cock*, is of Hay or Corn laid on heaps to preserve it against the extremities of the weather.
- Codware*, such Seed or Grain that is contained in Cods, as Pease, Beans, &c.
- Coke*, is Pit-Coal or Sea-Coal burned or converted into the nature of Charcoal.
- Cole*, *Cale*, or *Keal*, Coleworts from *Caulis*.
- A *Cole-fire*, is a parcel of Fire-wood set up for sale or use, containing when it is burnt a Load of Coals.
- Collers* about the Cattles necks, by the strength whereof they draw.
- A *Comb*, in some places it is said to be a Valley between Hills, and in some places a Hill or Plain between Valleys.
- Came*, The small Fibres, or Tails of Malt.
- Compas*, or *Compost*, Soil for Land, Trees, &c.

- Coniferous Trees**, are such that bear Cones, or Clogs, as the Fir, Pine, &c.
A Conservation, a place to keep Plants, Fruits, &c. in.
A Coomb or Coomb of Corn, is a measure containing four Bushels, or half a Quarter.
Coppice, Copise, or Copse, The smaller sort of Wood, or *Under-wood*.
A Cord of Wood is set out as the Coal-fire, and contains by measure four foot in breadth, four foot in height, and eight foot in length.
A Coffer, Lamb or Colt, or Cade Lamb or Colt, that is, a Lamb or Colt fallen and brought up by hand.
Covert, a shady place for Beasts.
A Cowl, a Tub or Pail.
A Cradle, is a frame of wood fixed to a Sythe for the moving of Corn, and causes it to be laid the better in swath; and it is then called a *Cradle Sythe*.
Crap, in some places Darnel is so called, and in some signifies *Buck-wheat*.
A Cratch, a Rack for Hay or Straw. *Vide Rack*.
A Crock, an earthen Pot.
A Croft, a small Inclosure.
Cranes, old Eaws.
A Crotch, the forked part of a Tree, usefull in many cases of Husbandry.
A Crow, or Crows of Iron; an Iron Bar with an end flat.
To Cultivate, to Till.
Culture, Tilling.
Culver, a Pigeon or Dove, thence Culver-house.
A Curry-comb, an Iron comb wherewith they comb Horses.
A Curtilage, a Gate-room or Back-side.
A Cyon, a young Tree or Slip springing from an old.

D.

- Dallops**, a term used in some places for Patches or Corners of Grass or Weeds among Corn.
Darnel, Cockle-weed, injurious to Corn.
To Denshire, is to cut off the Turf of Land; and when it is dry, to lay it on heaps and burn it.
To delve, to dig.
A Dibble, an instrument wherewith they make holes for the setting of Beans, &c.
A Dike, a Ditch.
A Doke, a word used in *Essex* and *Suffolk* for a deep dint or furrow.
A Doel, a great bank or mound between the Ploughed Lands in common Fields.
Dredge, Oats and Barley mixed.
Eraught, a long time of dry weather.
Dug of a Cow; that is, the Cows Teat.
A Dung-fork is a Tool of three Tines or Pikes, for the better casting of Dung.

E.

TO Ear or *Are*, to Plough or Fallow.

Earning, Runnet wherewith they convert Milk into Cheese.

Eddish, *Eadish*, *Etch*, *Ersb*, or *Eegrass*, the latter *Passure*, or Grass that comes after Mowing or Reaping.

To *Edge*, to Harrow.

Edifice, Building.

Egastment, Cattle taken in to graze, or be fed by the Week or Month.

Elden, that which in some places is called Ollet or Fewel.

The *Elder*, the Udder of a Cow or other Beast.

Espaliers, Trees planted in a curious order against a Frame, for the bounding of Walks, Borders, &c.

Exoticks, Forreign Plants, not growing naturally in our English Soyl.

F.

TO *Fallow*, to prepare Land by Ploughing, long before it be ploughed for Seed. Thus may you fallow, twi-fallow, and set-fallow; that is, once, twice, or thrice Plough it before the Seed-time.

A *Fan* is an instrument that by its motion artificially causeth Wind: useful in the Winnowing of Corn.

A *Farding-Land*, or *Fardale* of Land, is the fourth part of an Acre.

A *Fathom* of Wood is a parcel of Wood set out, for wherewith make a Coal Fire.

To *Faulten*. Thrashers are said to faulten, when they thrash or beat over the Corn again.

Feabes, or *Fea-berries*, Gooseberries.

Fenny, Boggy, Mouldy, as fenny cheese, or mouldy cheese.

To *Ferment*; that is, to cause Beer, Cider, or other Drinks to work, That the Dregs or impurities may be separated upwards or downwards.

Fermentation, such working.

Fertile, Fruitful.

Fertility, Fruitfulness.

Fetters are usually made of Iron, and hanged about the legs of Cattle, that they leap not, or run away.

Fewel, any combustible matter wherewith a fire is made.

Filly, a She-colt.

Fimble Hemp, that is the yellow early Hemp.

Flaggs, the surface of the Earth which they pare off to burn, or the upper Turf.

Floyt, a threshing instrument.

A *Fleak*, a Gate set up in a gap.

Floating, or drowning, or watering of Meadows: also *Flacking* of Cheese, is the separating the Whey from the Curd.

Flora, the Goddess of Flowers. Also the Title of Mr. *Ree* his excellent Treatise of Flowers.

Fodder, Hay, Straw, or such like for Cattle.

A *Fogg*, a thick Mist, and in some places signifies long grass remaining in Pasture till Winter.

Foisen, *Fuxsen*, or *Fosen*, Nourishment, Natural joyet, strength, Plenty, abundance, and Riches.

Foisty, Musty.

Fork. There are several sorts of them; some of Wood, some of Iron; some for Hay, others for Corn, &c.

To Fowl, that is, to fallow Land in the Summer, or Autumn.

A Foss, a Pit.

Fragrant, smelling pleasantly.

Frith, underwood, or the shroud of Trees.

A Frower, an edge-tool used in cleaving Lath.

A Fudder of Lead, a load, or Spiggs of sixteen hundred weight.

Furrow, the low Fall or drain in Land, either left by the Plough, or otherwise made.

G.

A *Gap,* an open place in a Hedge, or such like.

A Garner, a Granary to put Corn in.

A Garth, a Yard or Backside.

A Gawn or *Goan,* a Gallon.

Georgicks, belonging to Husbandry or Tillage; as *Virgils Georgicks,* his Books of Husbandry.

Germins, young shoots of Trees.

Germination, a budding forth.

A Gill. Vide *Berk.*

A Gimmer Lamb, or *Gummer Lamb,* an Ew Lamb.

Glandiferous, bearing Mast.

To Glean, to pick up or gather the shattered Corn.

A Goad, a small staff or rod with a sharp Iron pin at the end thereof, to quicken Horses or Oxen in their Motion.

A Geoff, or *Goffe,* a Mow or Reek of Corn or Hay.

A Gool, a Ditch.

To Gore, to make up such Mows or Reeks.

Goss, or *Gorse,* Furzes.

A Gratton, Eddish or Ersh.

A Gripp or *Gripe,* a small ditch or cut athwart any Meadow or Arable Land, to drain the same.

Groats, Oats after the Hulls are off, or great Oat-meal.

A Grove, or *Groove,* a deep Foss or pit sunk into the ground to search for Minerals, &c.

Grabbage. See *Mattock.*

T *O Hack,* that is to cut up Pease or other hawy stuff by the Roots, or to cut nimbly any thing.

To Hake, or *Hawl,* to draw.

Harneys, Ropes, Collers, and other accoutrements fitted to Horses, or other Beasts, for their drawing.

Hatches, Flud-gates placed in the water to obstruct its Current.

A Mattock, a Shock containing twelve sheaves of Corn.

Haws, the fruit of the white thorn.

A Haul, or *Haw,* an Iron Instrument for hacking up of weeds. An *Haw* is sometimes a close of Land.

Hawm, the stalks of Pease, Beans, or such like.
Head-land, that which is ploughed overthwart at the ends of the other Lands.

An **Heck**, a Racke, a Salmon-**Heck** a grate to take them in.

Heckle, an Instrument used in the trimming and perfecting of Hemp and Flax for the Spinner, by dividing the Tow or Hurds from the Tare.

Helm, is Wheat or Rye straw unbrailled by thrashing or otherwise, and bound in bundles for Thatching.

Heps, the fruit of the Black-thorn.

Herbage, The Feeding, Grasing, or Mowing of Land.

Heyrs, Young Timber-trees that are usually left for Standills in the felling of Copfes.

Hide-bound, a Disease whereunto Trees as well as Cattle are subject.

A **Hind**, a Servant in Husbandry.

Hillock, a little Hill, as a Hop-hill, &c.

Hogs, in some places Swine are so called; in some places young Weathers.

A **Holt**, a Wood.

Holms, places in the Water, as **Flathoms**, steep holms in **Severn** Mill-holms, &c.

Hook-Land, Land Tilled and Sowed every year.

A **Hoop**, a measure of a peck.

Hopper, wherein they carry their Seed-corn at the time of Sowing: Also the Vessel that contains the Corn at the top of the Mill.

How, an Instrument made like a Coopers Adds, for the cutting up of Weeds in Gardens, Fields, &c. and between Beans, Pease, &c.

Hovel, a mean Building or Hole for any ordinary use.

Hoven, Cheese that is raised or swelled up.

Hover-ground, Light-ground.

Hull, or **Halls**, the Chaff of Corn.

Hurds of Flax or Hemp, are the worser parts separated from the Tare in the Heckling of it, whereby may be made Linnen Cloath.

Hurdles, made in form of Gates, either of spleeted Timber or of Hazel Rods, they either serve for gates in Enclosures or to make Sheep-folds or the like.

Hatch, a vessel or place to lay Grain or such like thing in: also a Trap made hollow for the taking of Weasels, or such like Vermine alive.

Hut, a small Hovel or Cottage.

I.

A Jack, a term sometimes used for a Horse whereon they saw Wood.

Famock, Oaten-bread made into great Loves.

Iles, or **Oiles**. Vide **Ans**.

An **Imp**, a young Tree.

Infertile, Barren.

A **Jug**, A Common Pasture or Meadow.

Inoculation, the grafting or placing of the Bud of one Tree, into the Stock or Branch of another.

Irrigation, Watering of a Meadow, Garden, &c.

Irroration, a bedewing or besprinkling of a Plant.

Junames, that is Land sown with the same Grain that it was sown with the precedent year.

Inter;

Futer, a term used by some for the fertile coagulating saltish nature of the Earth.

K.

K *Arle Hemp*; that is, the latter green Hemp.

Kell, or *Kiln*, whereon they dry Malt or Hops.

H Kerve, a Fat wherein they work their Beer or Ale before they Tun it.

A Kidcrow, a place for a sucking Calf to lye in.

A Krimmel, a Powdring-Tub.

A Kis, a Pail.

Knolls, Turneps.

L.

L *Altary*, a Dairy-house.

Laire, *Lager*, or *Licare*, Places where Cattle usually repose themselves under some shelter, the ground being enriched by their Soyl.

A Lath, a Barn.

Laund, or *Lawn* in a Park, Plain and untilled Ground.

A Leap or *Lib*, half a Bushel, thence comes a Seed-leap.

To *Lease*, or *Leaze*. *Vide* to *Glean*.

Lentiles, a sort of Grain less than Fitches.

A Lift, a Stile that may be opened like a Gate.

Litter, Straw, or such like stuff for Cattle to lodge on.

To *Lock*, is a term used by Drivers in moving the fore-wheels of a Waggon to and fro.

Log, a term used in some places for a cleft of Wood, and in some places for a long piece or Pole, by some for a small Wand or Switch.

To *Lop*, to cut off the head-branches of a Tree.

A Lug, *Vide* *Pearsh*.

Lynchet, a certain line of green-sward or Bounds, dividing Arable Land in Common Fields.

M

M *Ads*, a Disease in Sheep.

Manger, the place wherein Beasts eat Corn, or other short Meat.

A Mash, or *Mesb*; Ground-Corn, or such like, boiled in Water for Cattle to Eat.

Mast, The Fruits of wild Trees, as of Oaks, Beech, &c.

Mattock, a Tool wherewith they grub Roots of Trees, Weeds, &c. by some called a *Grub-axe*, or *Rooting-axe*.

Mature, Ripe.

A Maund, A Basket, or rather a hand-basket with two lids to carry on ones Arm.

A Mayn-Comb, wherewith they kemb Horses Manes.

A Meak, wherewith they Mow or Hack Pease, or Brake, &c.

Mere, the same as *Lynchet*.

Metb, a small kind of *Metheglin*.

A Met, a strike or Bushel.

A Midding, a Dung-hil.

Mildew, a certain Dew falling in the Months of *June* and *July*; which being of a viscous Nature, much impedes the growth or Maturation of

of Wheat, Hops, &c. unless a showre of Rain wash it off. It is also very sweet; as appears by the Bees so mightily enriching their stores thereby.
Mil-houses, watry places about a Mill-dam.
Mislen, or *Masten*; Corn mixed, as Wheat, with Rye, &c.
A Mixen, a Dung-heap.
A Muzzy, a Quaguine.
Mogshade, the shadows of Trees, or such like.
The Mocks of a Net, the Mashies of a Net.
Mold, Earth.
Mounds, Banks or Bounds.
Mores or *Mours*, from the *British* word *Maur* a Hill, in the *Northern* parts signifies high and open places, and from the word *Morasse* signifies in other parts low and boggy places.
Muck, Dung or Soil.
Mullock, dirt or Rubbish.
Murc, the Husks or Chaff of Fruits, out of which Wine or other Liquors is pressed.
Must, the new Liquor or Pressure of Fruits, before Fermentation.

N.

A *Naile*, in some places eight pound, in some seven pound, being of a Hundred.
Neat, A Heifer, or any of the kind of Beeves.
A Neat-herd, a keeper of Neat, Beeves or Cows.
Neaving, Yeast or Barm.
A Nope, a Bulphinch.
A Nursery, a place set apart for the raising of young Trees or Stocks.

O.

O *Llet*, Fewel, the same with *Elder*.
Olitory, an *Olitory* Garden is a Kitchen-Garden, or a Garden of Herbs, Roots, &c. for food.
Omy-Land, Mellow Land.
Ope-Land, the same with Hook-Land.
Ost, *Oost*, or *Eest*; The same as Kell or Kiln.
Ore-wood, Sea-weeds or *Oose* wherewith they manure their Land.
An Ox boose, an Ox-stall.

P.

A *Paddle-staff*; a long staff with an Iron Bit at the end thereof, like a small Spade, much used by Molecatchers.
A Pail, the same as a Bucket.
Pallisade; a sort of flight open Pale or Fence, set to beautifie a place or Walk.
Palms, the white excrescencies of Buds of Sallies or Withy coming before the Leaf.
Pannage, the feeding of Swine or other Cattle on the Mast, or other Herbage, in Forrests, Woods, &c.

S f

A *Pannel, Pad, or Pack-saddle*; Kinds of Saddles whereon they carry burthens on Horse-back.

Parterre, or Partir, a name proper to a Garden divided into Beds, Walks, and Borders for curious Flowers, Herbs, &c.

Pease-bolt, Pease-hawm, or Straw.

Pedware, Pulse.

Penstocks, See Hatches.

A *Perch, or Lug* is sixteen foot and a half Land-measure, but is usually eighteen foot to measure Coppice-woods withal.

A *Piggin, A Payl* with one handle standing upright.

A *Pike, a Fork or Prong* of Iron.

A *Pile, a Parcel* of Wood, two whereof make one Cole-fire.

A *Piscary*, a liberty of Fishing, or a place where Fishes are confined.

A *Pitch-fork, or Pick-fork*; the same with *Pike*.

A *Plough*, a term used in the Western parts for a Team of Horse or Oxen.

A *Plough-wright*, one that makes Ploughs.

Podds, the *Cods or shells* of *Cod-ware*, or any other Seed.

Pollard, or Pollinger; an old Tree usually lopped.

To *Polt*, to beat or thrash.

Pomona, the Goddess of Fruits: Also the Title of several Treatises of *Fruit-Trees*.

Pregnant, Full as a Bud, or Seed, or kernel ready to sprout.

A *Prong*, the same as *Pike*.

To *Propagate*, to increase or multiply any thing.

A *Propagator*, a Planter.

To *Prune*, to trim Trees, by cutting off the superfluous Branches or Roots.

Puckets, Nests of Cater-pillars, or such like Vermine.

A *Puddock, or Purrock*; a small Inclosure.

Q.

Q *Quincunx*, Is an order of Planting Trees or Plants, that may be in order every way.

R.

A *Rack*, a place made to contain Hay, or other Fodder, for Beasts to feed on.

To *Ree, or Ray*; to handle Corn in a Sieve, so as the chaffy or lighter part gather to one place.

Reel, is either the long grass that grows in Fens, or watry places, or Straw bound up for thatching, by some called *Helm*. See *Helm*.

A *Reek* of Corn, a Mow or heap of Corn, so laid for its preservation, out of any Barn.

A *Reek-staval*, a frame of Wood placed on stones, on which such Mow is raised.

Rafinaceous, Rosiny, or yielding Rosin.

Rint, The Shrouds or tops of Trees, or fellings of Coppices.

A *Ride* of Hazle, or such like Wood, is a whole plump of Spriggs or Frith growing out of the same Root.

The

- The *Ridge*, the upper edge of a Bank or other rising Land.
 A *Riddle*, Vide *Rudder*.
 To *Ripple* Flax, to wipe off the seed-vessels.
Rising, Yeast or Barm, so called from the manner of its rising above the Ale or Beer.
 A *Rock*, an Instrument generally used in some parts for the spinning of Flax or Hemp.
 A *Rod*. See *Perch*.
 A *Roller*, wherewith they roll *Barley*, or other Grain.
 A *Rood*, a fourth part of an Acre.
Rough, the rough Coppice-wood, or Brushy-wood.
Roughings. Vide *Edisb*.
Rowen, Rough Pasture full of Stubble or Weeds.
Rudder, or *Ridder*, the widest sort of Sieves for the separating the Corn from the Chaff.
Runnet, a certain sow'r matter made use of by Country House-wives for the Coming (or Coagulation) of their Cheese.
Rural, Of, or belonging to the Country.
Rusticities, Country-Affairs.
Rustick, Country-like.

S

- A** *Seam* of Corn, eight Bushels, a *Seam* of Wood, an horse-load.
 A *seed lop*, *seed leap*, or *Seed-lip*; The Hopper or Vessel wherein they carry their Seed at the time of Sowing.
 A *Sean*, a kind of Net or rather *Siene*, from the River *Sein* in France.
 A *Seen*, or *Spene*. A Cows Teat or Pap.
 A *Seminary*, a Place where you sow Seeds for the raising of Trees or Plants.
 To *sew*, to drain Ponds, Ditches, &c. or a Cow is a *Sew* when her Milk is gone.
Shake-time, the season of the Year that Mast and such Fruits fall from Trees;
 A *Shard*. Vide *Gap*.
 A *Shaw*, a Wood that encompasses a Close.
 A *Shawle*, or Shovel.
 A *Sheat*, or Shutt, a young hog.
 A *shed*, a place erected and covered over for shelter for the Cattle, or any other use, against a Wall, or other Edifice.
 To *Sheer*, is used in the Northern parts for to Reap.
 A *Sike*, a Quillet or Furrow.
 A *Shippen*, a Cow-house.
Shock, several Sheaves of Corn set together.
 A *Shrape*, or *Scrape*; a place baited with Chaff, or Corn, to intice Birds.
 To *Shroud*, to cut off the head-branches of a Tree.
 A *sickle*, a toothed Reap-hook.
Sile, Filth.
 A *Site*, or *Scite*; a principal Mannor or Farm-house.
Sizzing. Vide *Rising*.
 To *Skid* a wheel, to stop the wheel with a hook at the descent of a hill.
Skilling. Vide *shed*.
 A *skepe*, or *Scuttle*; a flat and broad Basket, made to winnow corn withal.

- A *Skreyn* is an Instrument made of *Wyre* on a Frame, for the dividing of Corn from *Dust*, *Cockle*, *Ray*, &c. Also it is usually made of *Lath*, for the skreining of *Earth*, *Sand*, *Gravel*, &c.
- Slab*, the out side suppy Planch or Board sawn off from the sides of Timber.
- A *Sled*, a thing without Wheels whereon to lay a Plough, or other ponderous thing to be drawn.
- A *Sluce*, a Vent or Drain for Water.
- Sneed*, or *Snead*; The handle of a Sythe or such like Tool.
- Soufe*, the Offal of Swine.
- Sontage*, course Cloath, or Bagging for Hops, or such like.
- A *Spade*, or *Spitter*, wherewith they dig or delve: Also a Cutting Spade wherewith they cut Hay, or Corn-Mows.
- A *Shock* of Corn. See *Reek*.
- Staddles*, *Standils*, or *Standards*; Trees reserv'd at the Felling of Woods for growth for Timber.
- Staile*, or *Seale*, the handle of a Tool.
- Stale*, a living Fowl, put in any place to allure other Fowl, where they may be taken.
- Stamwood*, the Roots of Trees grubbed up.
- Stercoration*, Dunging.
- A *Stew*, a place to keep Fish in for present use.
- Sterile*, Barren.
- Straw*, Straw or Fodder.
- A *Stound*, or Vessel that stands an end of Earth or Wood.
- A *Stowk*, the handle of any thing or a shock of twelve sheaves.
- A *Stowre*, a round of a Ladder or Hedge-stake.
- A *Strike* of Flax, so much as is heckled at one handfull. Also it signifies an Instrument wherewith they strike Corn in the measuring. Also it is used in the Northern parts for a Measure containing about a Bushel.
- Structures*, Buildings.
- A *Struck*, a young Beeve, or Heifer.
- A *Sty*, a place for fattening or keeping Swine.
- Succulation*, a Pruning of Trees.
- Succulent*, Juicy.
- A *Sull*, a term used for a Plow in the Western parts.
- A *Salpaddle*, a small Spade-staff or Instrument to cleanse the Plough from the clogging Earth.
- To *Summer stir*, to Fallow Land in the Summer.
- A *Suffingle*, a large Girt that Carriers use to bind or fasten their Packs withall.
- Spard*, Ground is said to have a *Spard*, or to be *fwarded*, when it is well grown or Coated over with Grass or other Vegetables.
- Swath*, or *Swarth*; Grass, Corn, or such like, as it is laid by the Mower from the Sythe.
- To *Sweal* a Hog, to singe a Hog.
- Swill*, used in the Northern parts for shade, or shadow, sometimes for a Keeler to Wash in, standing on three feet.
- To *swingle* Flax, a term used by Flax-dressers.
- A *Swine-herd*, a keeper of Swine.
- A *Swyn* or *Swine-truc*, a Hogsty.
- A *Sythe*, wherewith they mow Grass or Corn.

T

- A** *Tabern*, a Cellar.
- Tare** of Flax, the finest dressed part thereof ready for the Spinner.
- Tares**, A sort of Grain.
- To Ted**, to turn or spread new mown Grass.
- A Teem**, or *Team*; a certain number of Horses, or other Beasts, for the Drought.
- Terrasse**, a walk on a Bank or Bulwark.
- Tes**; The Cows Dug by some is called the *Tes*.
- To Tew-taw-Hemp**, to beat or dress the same in an Engine made for that purpose.
- A Theave**, an Ew of the first year.
- A Thrave** of Corn contains four Shocks, each Shock consisting of six Sheaves.
- Tiching**, setting up Turves to dry that they may burn the better, a term used by the Western Burn-beaters.
- A Tike**, a small Bullock or Heifer.
- Tills**, Lentils, a sort of Pulse.
- Tylth**, Soyl, or other Improvement of Land.
- The Tine**, or grain of a Fork.
- Tis**, small Cattle.
- A Tovet**, or *Tofet*, half a Bushel.
- A Trammel** is an usual name for a Net, but is in many places used for an Iron moving Instrument in Chimneys, whereon they hang their Pots over the fire.
- A Trendle**, a flat Vessel, by some called a Kiver.
- A Trough**, a Vessel to hold water, &c. to feed Cattle in, &c. or for the beating of Apples for Cider, or the like.
- A Trugg**, a Milk-trey or such like.
- A Trundle**, a thing made and set on low wheels to draw heavy burdens on.
- A Trunchion**, a piece of Wood cut short like a Quarter-staff.
- A Tumbrel**, a Dung-cart.

V

- A** *Vat*, a Vessel to contain Beer, Ale, Cider, or any other Liquor in its preparation.
- Vallor**, or *Vallow*, or *Vate*; a Concave Mould wherein a Cheese is pressed.
- Velling**, ploughing up the Turf, a term used by the Western Burn-beaters.
- Vindemiation**; The gathering of Grapes, or reaping the Fruit of any thing; as of Cherries, Apples, Bees, &c.
- To Vindemiate**, to gather the same Fruits.
- Vinous**, Winy.
- Underwood**, Coppice, or any other Wood that is not esteemed Timber.
- A Voor**, or Furrow of Land.
- Urry**; the blew Clay that is digged out of the Coal-mines, and lies next the Coal, being crude and immature, and used for soiling of Land.
- Utensils**, Instruments used in any Art, especially Husbandry.

W

A *Wantey.* Vide *Suffingle.*

Wattle, the naked fleshy matter that hangs about a *Turkeys* head.

Wattles also signify splatted Gates or Hurdles.

A *Weanel*, a young Beast newly weaned.

Wecvils. Vide *Bouds.*

A *Whisker*, a Basket or Skuttle.

Whinnes, Furzes.

A *Wind-row*, Hay or Grass raked in Rows, in order to be set up in Cocks.

Winlace, or *Winch*; that by which any burden is wound up, or drawn out of a Well, or other deep place.

To *Winnow*, to separate by Wind the Corn from the Chaff.

To *Winterize*, to fallow Land in the Winter.

Wood-Land, Places where much Woods are; or it's generally taken for Countries enclosed.

Y

A *Yate*, or *Yatt*; a Gate.

A *Y oak*, is either an Instrument for Oxen to draw by, or to put on Swine or other unruly creatures, to keep them from running through Hedges.

Z

Z *Ephyrus*, The West-wind.

A N

A N

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